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3 April 2008

Section of Environmental Analysis
Surface Transportation Board
395 E Street SW
Washington, D.C. 20024 (express delivery)

Re: Consolidated Rail Corporation - Abandonment Exemption - in Hudson County, NJ, AB 167 (Sub-no. 1189X) and related proceedings.

Madams/Sirs:

This letter is on behalf of City of Jersey City, the Pennsylvania Railroad Harsimus Stem Embankment Preservation Coalition ("Embankment Coalition"), and Rails to Trails Conservancy (collectively referred to as "Commenters").

Consolidated Rail Corporation (Conrail) submitted an "environmental report" (ER) and an "historic report" (HR) for a proposed fast-track "class exemption" abandonment pursuant to a letter dated March 6, 2008, in this proceeding. Because of the abbreviated period suggested in the cover letter (three weeks) within which to provide comments on the ER/HR, Commenters hastened to provide such information as they had compiled under a letter expressed to STB's Section of Environmental Analysis (SEA) on March 28. This letter provides additional pertinent information. Before addressing the additional information, we wish to note a typographical error in the March 28 letter. The March 28 letter indicates that Conrail, without the required prior authorization from STB, sold the Harsimus Branch property in question here to SLH Properties in 2006. The sale was in 2005. Commenters filed their declaratory judgment petition (F.D. 34818) in January 2006.

Additional Information

A firm (Dresdner Robin) prepared a "Subsurface and Geotechnical Investigation Report" for the "Sixth Street Embankment Project, Jersey City, New Jersey," evidently for the Jersey City Redevelopment Agency, in November 1998. A copy of that report is provided herewith as Appendix I.

The report estimates the Embankment to contain 59,250 cubic yards of sandstone in its massive retaining walls, and an additional fill volume of soil of 154,800 cubic yards, for a total volume of 214,050 cubic yards. Report at p. 6. Assuming arguendo this material could be removed using larger-size dump trucks capable of transporting 10 to 15 cubic yards per load, somewhere between about 14,300 loadings and 21,400 loadings would be required to remove the Embankment. If smaller single-axle trucks were required, then the number of loadings would be roughly double the higher figure. In 1998, the consultants estimated that the cost for excavating the Embankment would be $1,100,000; the cost for hauling would range from $1,995,000 to 2,940,000; and if the soil and stone had to be disposed of, the cost would be an additional $8,650,000. The Report seems to estimate that the overall cost would range from "approximately $3.0M to $9.7M" where M means "million." Report p. 7. (The authors of the report evidently hoped some reuse of the material would be possible.) The cost would be higher now due to inflation and a tripling of fuel prices in the intervening decade.

The consultants found that lead, arsenic, mercury and antimony, and several PAH's [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(h)fluoranthene, benzo(k)fluoranthene, ideno(1,2,3-cd)pyrene, and dibenz(a,h)anthrazene] exceed the NJDEP residential direct contact soil cleanup criteria in the fill material. Thus the soil cannot be reused as clean fill. The material could be recycled, and the consultants suggest as subsurface fill material, if it were covered with clean fill or institutional controls (buildings, asphalt or pavement) and a Declaration of Environmental Restrictions (DER) were placed on the location receiving the soil. Alternatively, it would have to be disposed at a landfill. The consultants indicated that the cost for disposal (1998) would be $8,650,000 for all the material if it had to be disposed in its entirety due to the nature of the contamination.

The report does not address health hazards arising from exposure to airborne particulates from the removal of so much material in a residential area.

In 2005, in preparation to possible use in connection with eminent domain to acquire property at issue in this proceeding, City caused a preliminary environmental assessment to be prepared. That study was preliminary only. It did not include any actual sampling on the premises, although it noted that prior use of the premises for railroad purposes raised the possibility

of environmental contamination.

In early 2006, Dresdner Robin prepared for City a study entitled "Cost Analysis - 6th Street Embankment Demolition." This study updates the Dresdner Robin 1998 analysis of demolition costs. The consultants now estimate that the cost for demolition and disposal will run from $14,200,000 to $16,800,000. A copy of the report, without supporting worksheets and photographs, is attached as Appendix II.

This 1998 Dresdner Robin Report and that consultant's 2006 re-analysis undercuts several claims and intimations by Conrail in the ER/HR. For example, Conrail at page 2 of its ER suggests all structures have been removed. Conrail evidently forgot the 214,000 cubic yards of material in the Embankment as estimated by Dresdner Robin in 1998 (the estimate appears to have been refined, and to be somewhat lower in the 2006 analysis, but not so as to impact the comments herein). Conrail's claim in its ER about lack of traffic impacts seems to overlook the addition of 14,000 to more than 20,000 trucks to Jersey City residential streets for Embankment removal activities. Thus at page 4, it is hard to maintain that Conrail's plan would not add at least 50 vehicles per day on any road segment, at least during the demolition period.

As to the ER p. 5, based on sampling to date, the soil that must be removed would not constitute "clean fill." It does have certain contaminants exceeding NJDEP residential clean up standards. The material in question is immediately adjacent to a residential neighborhoods (and two National Register-listed National Historic Districts). The airborne dust from excavation and hauling of all this material poses unknown health hazards. The investigative report from 1998 indicates that proper disposal alone could cost in excess of $8 million, after excavation and hauling. The re-analysis in 2006 indicates costs will exceed $14,200,000. Even this cost estimate is likely low due to subsequent escalation of fuel costs.

The best approach to the Embankment is suggested indirectly in the Dresdner Robin reports: recycle the Embankment and cover it with an appropriate use and "DER" (a notice that indicates environmental restrictions). The best way to recycle the Embankment is to keep it intact as a part of the East Coast Greenway and for possible reinstitution of rail use. The surface could be covered with a trail and appropriate vegetation, pending possible inclusion of rail lines. That approach to "disposal" of contaminated railroad fill has been used in numerous rail trail projects, such as the Mullan Branch in Idaho. It saves space in

land fills and a considerable amount of money. Moreover, leaving the Embankment intact unquestionably would be less disruptive to the dense residential neighborhoods on both sides of the Embankment.

All these considerations serve to underscore yet another flaw in Conrail's ER/HR; namely, its limited disclosure of the suitability of not just the Embankment but the entire remains of the Harsimus Branch west of Luis Munoz Marin Boulevard for alternative public use under 49 U.S.C. 10905. Conrail refers only to comments of Hudson County in that regard. Based on F.D. 34818 and efforts by the City to acquire the property, Conrail is well aware of the interest of Jersey City and many others in either rail or alternative public use or both of the Embankment, and the Harsimus Branch west of Luis Munoz Marin Boulevard. Conrail wishes to ignore such use notwithstanding the environmental issues (and historic preservation issues) posed by doing so.

Although the Embankment is elevated out of the 100-year flood plain, Commenters believe that portions of the Embankment are surrounded by the 100-year flood plain, and that the west end of the Branch itself is in the 100-year flood plain. Conrail should perform a proper analysis, for the FEMA data are as available to Conrail as to the Commenters.

Respectfully submitted,

Charles H. Montange
for City of Jersey City,
Pennsylvania Railroad Harsimus Stem Embankment Preservation Coalition, and
Rails to Trails Conservancy

Of counsel:

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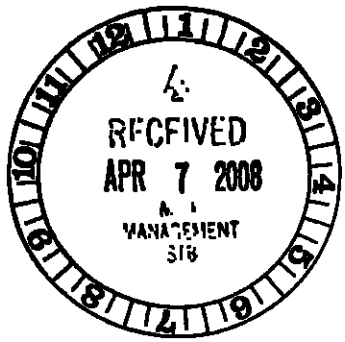
Appendices:
I - Subsurface and Geotechnical Investigation Report (Nov. 1998)
II - Cost Analysis (March 2006)

cc. Jersey City
Coalition
RTC
Mr. Terry Karshner, Deputy
NJ Historic Preservation Office
NJ Department of Environmental Protection
P.O. 404
Trenton, NJ 08625-0404
Mr. Enright (Conrail)

Appendix I



SUBSURFACE AND GEOTECHNICAL INVESTIGATION REPORT SIXTH STREET EMBANKMENT PROJECT JERSEY CITY, NEW JERSEY

Prepared for:

JERSEY CITY REDEVELOPMENT AGENCY

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DRESDNER ROBIN

NOVEMBER 1998
SUBSURFACE AND GEOTECHNICAL INVESTIGATION REPORT
SIXTH STREET EMBANKMENT PROJECT
JERSEY CITY, NEW JERSEY

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DRESDNER ROBIN

SUBSURFACE AND GEOTECHNICAL INVESTIGATION REPORT
SIXTH STREET EMBANKMENT PROJECT
JERSEY CITY, NEW JERSEY

1.0 INTRODUCTION

This Subsurface Site Investigation (SI) and Geotechnical Report has been prepared for the Jersey City Redevelopment Agency (JCRA) property which consists of six former Conrail embankments (hereinafter the "Site") located along the south side of 6th Street between Luis Munoz Marin Boulevard (to the east) and Brunswick Avenue (to the west), in Jersey City, New Jersey. The investigation was conducted to obtain geotechnical and environmental data within and beneath the embankments. DRESDNER ROBIN conducted the investigation in accordance with the scope of work set forth in a proposal dated October 20, 1997 as modified at a meeting with JCRA on November 7, 1997.

2.0 SITE DESCRIPTION

The Site consists of six former rail embankments situated within a predominantly residential area along 6th Street between Luis Munoz Marin Blvd. and Brunswick Ave. at Block 317, Lot 50.A, Block 280, Lot 50.A, Block 247, Lot 50.A, Block 354, Lot 50 A, Block 389.1, Lot 50, and Block 415, Lots 50PL and 52 in Jersey City, New Jersey. The embankments were constructed as filled structures confined by vertical cut stone retaining walls on all sides. The embankments, varying approximately 15 to 25 feet in height, 400 feet in length, and 90 to 100 feet wide, were built in the late 1800's. The location of the Site relative to the region is shown on Figure 1. A site plan depicting the embankments and soil sampling locations (environmental and geotechnical) is presented as Figure 2.

3.0 SCOPE OF WORK

The investigation program was developed to obtain geotechnical and environmental data from each of the six rail embankment structures. The embankments are all inaccessible from ground level necessitating that equipment and personnel be lifted into place. Upon consultation with the JCRA it was determined to conduct the work in two phases. The environmental borings were obtained through the use of a truck mounted Geoprobe system lifted by crane onto each of the embankment areas. The geotechnical samples were collected from borings conducted at-grade immediately adjacent to the embankment walls.

DRESDNER ROBIN conducted an environmental sampling program to assess the type and level of contamination associated with the embankments at the Site. In conjunction with the environmental sampling program, DRESDNER ROBIN subcontracted MATRIX Environmental and Geotechnical Services, Inc. (MATRIX) to conduct a geotechnical investigation at the Site.

The Environmental Sampling Program consisted of collecting soil samples for analytical purposes from 2 shallow borings made in each embankment (See Figure 2). Continuous sampling was conducted through the embankment material up to 4 feet into the underlying fill/native soil. Three samples were collected at predetermined depths from each of the shallow borings and submitted for laboratory analysis for Target Compound List +30/Target Analyte List (TCL/TAL+30), Total Petroleum Hydrocarbons (TPH) and Hexavalent Chromium (Cr^{6+}) The sampling depths were staggered so as to provide a representative profile of the embankment material and the underlying native soil that will be impacted by the proposed site development.

The analyses were performed on standard turn-around basis by Envirotech Research, Inc. of Edison, New Jersey; a New Jersey certified laboratory. The analytical results were compared with applicable NJDEP soil cleanup criteria to evaluate the management of the material during site development, including the potential for reuse on other city projects.

The geotechnical borings were advanced utilizing a Mobile B-57 truck mounted drill rig using hollow stem augers and split spoon samplers. Geotechnical borings were advanced adjacent to the six raised embankments to a depth of 24 feet below ground surface (bgs) see Figure 2. Standard split spoon sampling (five feet intervals) was conducted in each boring for geotechnical purposes. Geotechnical samples were collected for moisture content, grain size, and/or Atterberg limits on representative samples from each geotechnical boring.

4.0 METHODS AND PROCEDURES

4.1 Environmental Investigation

A total of 12 soil borings were conducted in order to collect environmental data at the Site. Two soil borings were conducted on each of the six embankments. Soil samples were collected for laboratory analysis at staggered depths providing a representative profile of the embankment material and the underlying native soil. Drilling of the soil borings was performed by Summit Drilling Company Inc., a New Jersey licensed well driller. The soil boring locations are shown on Figure 2. A cross-section of the embankments showing the sample depths is presented as Figure 3. Drilling activities were conducted under the supervision of a DRESDNER ROBIN geologist. Drilling was conducted on December 3 through December 5, 1997. The soil borings were performed in accordance with the procedures and protocols detailed in the NJDEP Field Sampling Procedures Manual.

A crane was used to lift the drilling equipment on top of each embankment. Soil borings were advanced using a pickup mounted Geoprobe System to a depth of 16 to 32 feet below the top of the embankments (up to four feet into the native soil). Continuous sampling was conducted through the embankment material and up to four feet within the native soil. Borings were advanced using a hydraulically driven core-barrel sampler. Three soil samples were collected per boring using a 4 foot stainless-steel core barrel with an acetate liner for sample recovery The

Geoprobe drilling tools were decontaminated before each use. Upon opening the acetate liner, the soil was visually inspected for contamination and screened with an HNu photoionization detector (PID) for organic vapors Soil samples submitted for VOC analysis were collected using the NJDEP required methanol preservation method.

Descriptions of the soil lithology and PID results were recorded in DRESDNER ROBIN boring logs (See Appendix 1). The soil lithology was classified using the modified Burmister Classification System for soil descriptions.

All soil samples were obtained in compliance with NJDEP-specified procedures (NJDEP Field Sampling Procedures Manual) and the investigation proposal dated October 20, 1997 as modified by a meeting between JCRA and DRESDNER ROBIN. The soil samples were retrieved daily by the laboratory courier. All soil samples were submitted for TCL+30/TAL, TPH, and Cr+6 analysis. A sampling summary table is included as Table 1. Aqueous quality assurance/quality control (QA/QC) field rinsate and trip blank samples were collected to demonstrate that the sampling protocols did not lend any uncertainty to the analytic findings with regard to handling practices or the type of materials used for sampling. Three duplicate and three field blank samples were collected and analyzed for the same parameters as the soil samples. An analytical methods/quality assurance summary is provided in Table 2. Analyses were performed by Envirotech Research, Inc. of Edison, New Jersey, a New Jersey certified laboratory.

4.2 Geotechnical Investigation

During the period November 24 through November 26, 1997, MATRIX conducted geotechnical investigations at the Site. A total of 11 soil borings were conducted alongside the embankments in order to obtain geotechnical information for the underlying soil. Boring location (B-1) was eliminated from the planned drilling program of 12 borings due to the presence of underground utility lines. The borings were conduced by Summit Drilling Co. in accordance with ASTM D-1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Two soil borings were advanced at street level adjacent to each of the elevated railroad embankments. Split spoon soil samples were taken at nominal intervals of five feet. The locations of the soil borings are shown on Figure 2 Representative soil samples were collected and tested in the MATRIX geotechnical laboratory for moisture content, grain size, and/or Atterberg limits. For more detailed information about the methodology used during the geotechnical investigation, See Appendix 4.

5.0 RESULTS

5.1 Environmental Investigation

5.1.1 Soil Characteristics

The geology within the six railroad embankments has been interpreted from the geologic information gathered during drilling activities. Soil boring logs are presented in Appendix 1. The fill materials within the embankment consist primarily of brown to red-brown silty sand mixed with minor amounts of gravel, cinders, and brick fragments. Based on visual and field screening observations, soil samples collected from the embankments did not indicate any physical evidence of contamination.

5.1.2 Soil Quality

Volatile Organic Compounds

The analytical results for all soil samples collected from the embankments during the environmental investigation indicate that the volatile organic compound (VOC) concentrations were all detected below the NJDEP residential direct contact soil cleanup criteria The laboratory analytical results are summarized in Table 3. The laboratory data summary sheets are provided in Appendix 2. The complete laboratory report is provided as an Attachment.

Semivolatile Organic Compounds

All base neutral compound concentrations were detected below the NJDEP residential direct contact soil cleanup criteria with the exception of several polynuclear aromatic hydrocarbons (PAH). With the exception of soil sample locations SB-7, SB-8, and SB-10, PAH's were reported in exceedance of one or more of the NJDEP residential direct contact soil cleanup criteria in all soil samples collected from the embankments during the environmental investigation. The PAH's consisted of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(h)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene. PAH concentrations ranged from 720 to 12,000 ug/kg. Sampling results are presented in Table 4. The PAH concentrations in exceedance of the NJDEP criteria are presented on Figure 4. The laboratory data summary sheets are provided in Appendix 2. The complete laboratory report is provided as an Attachment.

Pesticides/ Polychlorinated Biphenyls

Pesticides/polychlorinated biphenyls (PCB) concentrations were not detected above the NJDEP residential direct contact soil cleanup criteria for any soil samples collected from the embankments during the environmental investigation. The laboratory analytical results are summarized in Table 5. The laboratory data summary sheets are provided in Appendix 2 A complete laboratory report is provided as an Attachment.

Inorganic Compounds

Inorganic compounds were detected below the NJDEP residential direct contact soil cleanup criteria except for lead, mercury, antimony and arsenic. Lead was detected above the NJDEP residential direct contact soil cleanup criteria (400 mg/kg) at soil boring locations SB-5 (10.5-11.0 feet; 1020 mg/kg), SB-7(1.5-2 0 feet; 509 mg/kg), SB-11 (3.0-3.5 feet; 569 mg/kg and 22.0-22.5 feet; 3340 mg/kg), and SB-12 (12.5-13.0 feet; 420 mg/kg). Mercury was detected above the residential direct contact soil cleanup criteria at SB-1(11.5-12.0; 15.9 mg/kg). Antimony was detected above the residential direct contact soil cleanup criteria at a concentration of 15.7 mg/kg at SB-4(1.5-2.0), and 33.2 mg/kg at SB-7(1.2-2). Arsenic was also detected above the residential direct contact soil cleanup criteria (20 mg/kg) at a concentrations of 23.5 mg/kg at SB-4(1.5-2), 24.5 mg/kg at SB-7(1.5-2), and 34.9 mg/kg at SB-11(3-3.5).

Sampling results are presented in Table 6. The metals concentrations in exceedance of the NJDEP residential direct contact cleanup criteria are shown on Figure 3. The laboratory data summary sheets are provided in Appendix 2. A complete laboratory report is provided as an Attachment.

Wet Chemistry (Chromium VI, Total Cyanide, and Total Petroleum Hydrocarbons)

Chromium VI (Cr^{6+}), Total Cyanide, and Total Petroleum Hydrocarbons (TPHC) concentrations were not detected above the NJDEP residential direct contact soil cleanup criteria in any soil samples collected from within embankments during the environmental investigation. The laboratory analytical results are summarized in Table 7. The laboratory data summary sheets are provided in Appendix 2. The complete laboratory report is provided as an Attachment.

5.2 Geotechnical Investigation Results

The soil borings advanced during the geotechnical investigation revealed a subsoil profile consisting of a surface fill layer overlying native red brown and gray silty sands and gravels, and clayey silts. Fill is generally encountered to 2.5 feet below grade (bg) or less, except at B-6 where fill was measured at 7 feet bgs. Fill was not identified in borings B-2 and B-7. The fill material consist predominately of silty sands and gravel with small amounts of cinders, bricks and concrete fragments. The native soil generally consists of loose to very compact silty sands and gravels, and firm to very stiff clays and silts. Layers of fibrous peat and soft organic silt were revealed in the subsurface profile in four borings (B-8, B-8, B-11, and B-12) in the western portion of the site.

The MATRIX report, evaluating the environmental characteristics of the embankment fill and native soil and the geotechnical properties of the native soils, is included as Appendix 3. The report discusses the suitability of the fill for possible reuse on or off the site, and addresses the following geotechnical issues:

- The type and engineering quality of the existing embankment materials and recommendations for reuse as structural fill.

- Recommendations for an appropriate type of building foundation system.
- Recommendations for foundation design, substructure wall design, and foundation installation criteria.
- Recommendations for slab support and underslab drainage requirements.
- Estimation of post-construction settlement of the recommended foundation system.
- Recommendations for management of groundwater during and after foundation and substructure construction.
- Recommendations for borrow material, if required, and material compaction and general earthwork construction procedures.

6.0 EMBANKMENT DEMOLITION COST ESTIMATE

The cost of embankment demolition can vary greatly depending on the availability of a reuse market for the soil and stone block materials of construction. As a result, timing and the availability of projects able to utilize contaminated fill materials will be a significant factor in the demolition cost of the embankment. To develop a range for likely costs, DRESDNER ROBIN has considered to disposal options: beneficial reuse and landfill disposal.

For quantity estimation purposes, DRESDNER ROBIN has assumed that the walls increase in thickness one foot horizontal per two feet vertical (2:1) from top to bottom, and that they extend a maximum eight feet below grade. Based on these assumptions and field measurements of the size of each embankment, the volumes of sandstone and soil to be removed calculate as follows:

Summary of Volume Calculations
(quantities in cubic yards)

Embankment	Sandstone Volume	Soil Volume	Total Volume
Brunswick St.-Monmouth	12600	30000	42600
Monmouth Ave.-Cole St.	11350	27625	38975
Cole St.-Jersey Ave.	10850	27250	38100
Jersey Ave.-Erie St.	9350	26000	35350
Erie St.-Manila Ave.	8100	23425	31525
Manila Ave.-Marin Blvd.	6775	20500	27275
West of Brunswick St. [1]	225	0	225
Total all Embankments	59250	154800	214050

The calculations assume that all of the sandstone (including that which is below grade) will be removed and that all soil contained by the embankments (above grade only) will be removed. These calculations are presented in Appendix 5.

[1] Remaining portion of embankment wall west of Brunswick Street to be removed

Disposal options of beneficial reuse, and landfill disposal are presented below to cover the range of costs that will be reflected in market timing. Based on the limited environmental investigation conducted by DRESDNER ROBIN, it is assumed that all of the soils from the embankment will be considered contaminated (non-hazardous ID-27 waste) and will require disposal in a permitted beneficial reuse area or landfill. DRESDNER ROBIN has also assumed that the volume of subsurface sandstone to be removed will not be replaced with clean fill and that building footings and sub-basement construction will occupy the excavated areas.

Removal Cost Factors

Embankment Removal/Excavation/ Loadout	$ 1,100,000
Hauling	
- 2 Mile	$ 1,995,000
- 5 Mile	$ 2,520,000
-10 Mile	$ 2,940,000
Disposal ID-27 @ $40/TN	$ 8,050,000
Disposal of Stone @ $ 10/CY	$ 600,000

As indicated by the above listed cost factors, removal of the embankment can range from approximately $3.0M to $9 7M. Under the best possible circumstances a project seeking significant fill volumes may be willing to remove the embankment for the value of the fill.

7.0 CONCLUSIONS AND RECOMMENDATIONS

1. The analytical results for soil samples collected as part of the environmental investigation of the six embankments indicate that the concentrations of volatile organics, acid extractables, pesticides, PCBs, TPH, Cr^{6+} and cyanide in the fill materials are below the NJDEP residential direct contact soil cleanup criteria with the exception of several PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(h)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and dibenz(a,h)anthracene). The concentrations of all metals were below the NJDEP residential direct contact soil cleanup criteria with the exception of lead, arsenic, mercury and antimony.

2. The analytical results for the soil samples collected of the embankment material indicate the soil cannot be reused as clean fill at other city projects due to the elevated concentrations of several PAHs and metals above the NJDEP residential direct contact soil cleanup criteria. The options for the final disposition of the soil in the embankments are recycling or disposal at a landfill, possibly as final cover at the landfill. If the material is reused at other city projects, the material would most likely need to be used as subsurface fill material, covered with either clean fill or some other institutional control (buildings, asphalt or pavement) and a Declaration of Environmental Restrictions (DER) would be required for the location receiving the soil.

3. Refer to Appendix 4, MATRIX Environmental geotechnical evaluation for conclusions and recommendations regarding the geotechnical investigation.

4. Measurements and calculations of the embankments have estimated that the total volume of material to be removed is 59,250 cubic yards of sandstone and 154,800 cubic yards of soil. The results of the environmental investigation show that the soils in the embankments will most likely be classified as non-hazardous (ID-27) waste. This will prohibit reuse of these soils at other sites without appropriate engineering and institutional controls. Based on the calculated amounts of sandstone and soil and the necessity to dispose of the soils, the total estimated cost of demolition of the embankments will likely vary between $3.0M and $9.7M depending on the disposal option available for the soils.

TABLE 1

SAMPLING SUMMARY TABLE
SIXTH STREET, JERSEY CITY, NEW JERSEY

BORING	SAMPLE NUMBER	MEDIUM	SAMPLE DEPTH (feet below top of embankment)	Analytical Parameters	Sampling Method
SB-1	SB1/1 5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB1/11.5-12	Soil	11 5-12	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB1/19 5-20	Soil	19 5-20	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-2	SB2/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB2/15 5-16	Soil	15 5-16	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB2/19 5-20	Soil	19.5-20	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-3	SB3/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB3/10-10.5	Soil	10-10.5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB3/19.5-20	Soil	19.5-20	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-4	SB4/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB4/14.5-15	Soil	14.5-15	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB4/23.5-24	Soil	23.5-24	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-5	SB5/1.5-2	Soil	1 5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB5/10.5-11	Soil	10.5-11	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB5/23 5-24	Soil	23 5-24	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-6	SB6/2.5-3	Soil	2 5-3	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB6/12.5-13	Soil	12 5-13	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB6/23.5-24	Soil	23 5-24	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-7	SB7/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB7/19 5-20	Soil	19 5-20	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB7/27 5-28	Soil	27 5-28	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-8	SB8/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB8/15 5-16	Soil	15 5-16	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB8/27.5-28	Soil	27 5-28	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-9	SB9/1.5-2	Soil	1 5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB9/16-16 5	Soil	16-16 5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB9/24-24 5	Soil	24-24 5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-10	SB10/1.5-2	Soil	1.5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB10/11-11 5	Soil	11-11.5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB10/31.5-32	Soil	31 5-32	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
				TCL/TAL+30,TPH, Cr^{6+}	
SB-11	SB11/3-3 5	Soil	3-3 5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB11/22-22.5	Soil	22-22 5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB11/31-31.5	Soil	31-31 5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
SB-12	SB12/1 5-2	Soil	1 5-2	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB12/12 5-13	Soil	12 5-13	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe
	SB12/31-31 5	Soil	31-31.5	TCL/TAL+30,TPH, Cr^{6+}	GeoProbe

TABLE 2

Analytical Methods/Quality Assurance Summary Table
Sixth Street Embankment Project
Jersey City, New Jersey

Matrix Type	# Sample	Field Blank/ Trip Blank	Analytical Parameters	Analytical Methods	MS/MSD	Duplicates	Split-Spoon	Performance Evaluation Samples	Sample Preservation	Sample Holding Time
Soil	36	Field Blanks:								
		FB12397 MEOH-12397 12/3/97	TCL/TAL+30, Cr^{6+}, TPH	See Appendix 3	None	Dup. (Dup. Of SB2/15 5-16)	None	None	See Appendix 3	See Appendix 3
		FB12497 MEOH-FB 12/4/97	TCL/TAL+30, Cr^{6+}, TPH	See Appendix 3	None	Dup. 2 (Dup of SB9/1.5-2)	None	None	See Appendix 3	See Appendix 3
		FB125197 12/5/97	TCL/TAL+30, Cr^{6+}, TPH	See Appendix 3	None	Dup. 3 (Dup of SB-12/12.5-13)	None	None	See Appendix 3	See Appendix 3
		Trip Blanks:								
		MEOH-TB 34373 12/3/97	TCL VOA	See Appendix 3	None					
		MEOH-TB 34537 12/4/97	TCL VOA	See Appendix 3	None					
		MEOH-TB 34697 12/5/97	TCL VOA	See Appendix 3	None					

TABLE 3

Summary Analytical Results of Volatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB1-LS-2	SB1-11 5-12	SB1-19 9-20	SB2-1 5-2	SB2-15.5-16	SB2-19.5-20	SB3-1 5-2 0	SB3-10-10.5	SB3-19.5-20	SB4-1 5-2 0
Lab Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370
Sampling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				50 0	50.0	50 0	50.0	50 0	50.0	50 0	50.0	50 0	50 0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	*New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)*	*New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)*										
VOLATILE COMPOUNDS (GC/MS)													
Chloromethane	520,000	1,000,000	10,000	130 U	150 U	140 U	120 J	170 U	130 U	130 U	160 U	150 U	140 U
Bromomethane	79,000	1,000 000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
VinylChloride	2,000	7,000	10,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Chloroethane	NA	NA	NA	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
MethyleneChloride	49 000	210,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Acetone	1,000,000	1,000,000	100,000	670 U	750 U	710 U	640 U	850 U	640 U	660 U	800 U	740 U	700 U
CarbonDisulfide	NA	NA	NA	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1,1 Dichloroethene	8,000	150,000	10 000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1 1 Dichloroethane	570,000	1,000,000	10 000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
trans-1 2 Dichloroethene	1,000,000	1,000,000	50,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
cis-1,2-Dichloroethene	79,000	1,000,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Chloroform	19,000	28,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1,2-Dichloroethane	6,000	24,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
2-Butanone	1,000,000	1 000,000	50 000	670 U	750 U	710 U	640 U	850 U	640 U	660 U	800 U	740 U	700 U
1 1,1-Trichloroethane	210,000	1,000,000	50,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Carbon Tetrachloride	2,000	4 000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Bromodichloromethane	11,000	46,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1,2 Dichloropropane	10,000	43,000	NA	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
cis 1 3-Dichloropropene	4 000	5,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Trichloroethene	23,000	54,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Dibromochloromethane	110,000	1,000,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1,1,2-Trichloroethane	22,000	420,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Benzene	3,000	13,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
trans-1 3-Dichloropropene	4 000	5,000	1 000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Bromoform	86,000	370,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
4-Methyl-2-Pentanone	1 000,000	1,000,000	50,000	670 U	750 U	710 U	640 U	850 U	640 U	660 U	800 U	740 U	700 U
2 Hexanone	NA	NA	NA	670 U	750 U	710 U	640 U	850 U	640 U	660 U	800 U	740 U	700 U
Tetrachloroethene	4,000	8,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
1 1,2 2 Tetrachloroethane	34,000	70,000	1,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Toluene	1,000,000	1,000,000	500,000	130 U	150 U	140 U	130 U	170 U	130 U	290	160 U	150 U	140 U
Chlorobenzene	37,000	680,000	1 000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Ethylbenzene	1,000,000	1,000,000	100,000	130 U	150 U	140 U	130 U	170 U	130 U	190	160 U	150 U	140 U
Styrene	23,000	97,000	100,000	130 U	150 U	140 U	130 U	170 U	130 U	130 U	160 U	150 U	140 U
Xylene(Total)	410,000	1,000,000	10,000	130 U	150 U	140 U	130 U	170 U	130 U	790	160 U	150 U	140 U
Total Constituent Conc VOAs (s)				0	0	0	0	0	0	1270	0	0	0
Total Estimated Conc VOA TICs (s)				2700	3900	1600	1200	8800	920	11320	6300	2200	4900

Notes

* Values listed reflect the combined standards for the cis and trans isomers of 1,3-Dichloropropene.

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

NR - Not analyzed.

Dup Duplicate sample of SB2-15 5-16

Dup2 Duplicate sample of SB9-1 5-2

Dup3 Duplicate sample of SB12-12 5-13

TABLE 3

Summary Analytical Results of Volatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB4-14.5-15	SB4-23.5-24	SB5-1 5-2	SB5-10.5-11	SB5-23.5-24	SB6-2.5-3	SB6-12 5-13	SB6-23.5-24	SB7-1 5-2	SB7-18.5-20	SB7-27 5-28
Lab Sample Number				34371	34372	34529	34530	34531	34532	34533	34534	34539	34540	34541
Sampling Date				12/03/97	12/03/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				50 0	50.0	50 0	50 0	50 0	50.0	50.0	50.0	50 0	50 0	50 0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)											
VOLATILE COMPOUNDS (GC/MS)														
Chloromethane	520,000	1,000,000	10,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Bromomethane	79,000	1,000,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
VinylChloride	2,000	7,000	10,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Chloroethane	NA	NA	NA	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
MethyleneChloride	49,000	210,000	1,000	150 U	140 U	110 JB	100 JB	110 JB	100 JB	60 JB	120 JB	170 B	160 B	210 B
Acetone	1,000,000	1,000,000	100,000	750 U	710 U	700 U	710 U	670 U	600 U	630 U	650 U	660 U	600 U	710 U
CarbonDisulfide	NA	NA	NA	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1 1 Dichloroethene	8,000	150,000	10,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1,1-Dichloroethane	570,000	1,000,000	10,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
trans-1 2-Dichloroethene	1,000,000	1,000,000	50,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
cis-1,2-Dichloroethene	79,000	1,000,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Chloroform	18,000	28,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1,2 Dichloroethane	5,000	24,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
2-Butanone	1,000,000	1,000,000	50,000	750 U	710 U	700 U	710 U	670 U	600 U	630 U	650 U	660 U	600 U	710 U
1,1 1-Trichloroethane	210,000	1,000,000	50,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
CarbonTetrachloride	2,000	4,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Bromodichloromethane	11,000	46,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1,2-Dichloropropane	10,000	43,000	NA	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
cis-1 3 Dichloropropene	4,000	5,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Trichloroethene	23,000	54,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Dibromochloromethane	110,000	1,000,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1 1,2-Trichloroethane	22,000	420,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Benzene	3,000	13,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
trans-1,3-Dichloropropene	4,000	5,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Bromoform	88,000	370,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
4 Methyl-2 Pentanone	1,000,000	1,000,000	50,000	750 U	710 U	700 U	710 U	670 U	600 U	630 U	650 U	660 U	600 U	710 U
2-Hexanone	NA	NA	NA	750 U	710 U	700 U	710 U	670 U	600 U	630 U	650 U	660 U	600 U	710 U
Tetrachloroethene	4,000	8,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
1 1 2 2 Tetrachloroethane	34,000	70,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Toluene	1,000,000	1,000,000	500,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	61 J	120 U	140 U
Chlorobenzene	37,000	680,000	1,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Ethylbenzene	1,000,000	1,000,000	100,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Styrene	23,000	97,000	100,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	130 U	120 U	140 U
Xylene(Total)	410,000	1,000,000	10,000	150 U	140 U	140 U	140 U	130 U	120 U	120 U	130 U	88 J	120 U	140 U
Total Confident Conc. VOAs (s)				0	0	0	0	0	0	0	0	0	0	0
Total Estimated Conc. VOA TICs (s)				7500	870	0	2400	1300	1200	860	5100	3600	1100	990

Notes
* Values listed reflect the combined standards for the cis and trans isomers of 1,3-Dichloropropene
U - The compound was not detected at the indicated concentration.
J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.
B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.
NR - Not analyzed
Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1 5-2
Dup3 Duplicate sample of SB12-12 5-13

TABLE 3

***Summary Analytical Results of* Volatile Organic Compounds for Soil Samples Collected**
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB8-1 5-2	SB8-15 5-16	SB8-27 5-28	SB9-1 5-2	SB9 16-16.5	SB9-24-24 5	SB10-1 5-2	10-11-11 5	B10-31 5-32	SB11-3-3 5	B11-22-22.5	B11-31-31 5
Lab Sample Number				34542	34543	34544	34545	34546	34547	34548	34549	34550	34693	34894	34895
Sampling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/05/97	12/05/97	12/05/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				50 0	50.0	50.0	50 0	50 0	50 0	50 0	50.0	50.0	50 0	50.0	50 0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to *Ground Water* Soil Cleanup Criteria (ug/kg)												
VOLATILE COMPOUNDS (GC/MS)															
Chloromethane	520,000	1,000,000	10,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Bromomethane	79,000	1,000,000	1,000	140 U	120 U	120 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
VinylChloride	2,000	7,000	10,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Chloroethane	NA	NA	NA	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
MethyleneChloride	49,000	210,000	1,000	170 B	160 B	160 B	180 B	140 B	180 B	200 B	200 B	210 B	170 B	230 B	170 B
Acetone	1,000,000	1,000,000	100,000	700 U	590 U	530 U	680 U	600 U	740 U	740 U	690 U	640 U	700 U	710 U	690 U
CarbonDisulfide	NA	NA	NA	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1,1-Dichloroethene	8,000	150,000	10,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1 1-Dichloroethene	570,000	1,000,000	10,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
trans-1,2 Dichloroethene	1 000,000	1,000,000	50,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
cis-1 2-Dichloroethene	79,000	1,000,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Chloroform	19,000	26,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1,2-Dichloroethane	6,000	24,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
2 Butanone	1,000,000	1,000,000	50,000	700 U	590 U	110 U	680 U	600 U	740 U	740 U	690 U	640 U	700 U	710 U	690 U
1,1 1 Trichloroethane	210,000	1,000,000	50 000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
CarbonTetrachloride	2,000	4,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Bromodichloromethane	11,000	46,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1 2-Dichloropropane	10,000	43,000	NA	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
cis-1,3 Dichloropropene	4,000	5,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Trichloroethene	23,000	54,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Dibromochloromethane	110,000	1,000,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1 1,2-Trichloroethane	22,000	420,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Benzene	3,000	13,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	190
trans-1,3-Dichloropropene	4,000	5,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Bromoform	88,000	370,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
4-Methyl 2-Pentanone	1,000,000	1,000,000	50,000	700 U	590 U	530 U	680 U	600 U	740 U	740 U	690 U	640 U	700 U	710 U	690 U
2 Hexanone	NA	NA	NA	700 U	590 U	530 U	680 U	600 U	740 U	740 U	690 U	640 U	700 U	710 U	690 U
Tetrachloroethene	4,000	6,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
1 1,2 2-Tetrachloroethane	34,000	70,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Toluene	1,000,000	1,000,000	500,000	180	120 U	110 U	140 U	120 U	150 U	180	140 U	130 U	140 U	140 U	370
Chlorobenzene	37,000	680,000	1,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	140 U
Ethylbenzene	1,000,000	1,000,000	100,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	290
Styrene	23,000	97,000	100,000	140 U	120 U	110 U	140 U	120 U	150 U	150 U	140 U	130 U	140 U	140 U	87 J
Xylene(Total)	410,000	1,000,000	10,000	230	120 U	110 U	140 U	120 U	150 U	350	140 U	130 U	140 U	140 U	970
Total Confident Conc. VOAs (s)				410	0	0	0	0	0	510	0	0	0	0	1820
Total Estimated Conc. VOA TICs (s)				1100	640	1300	1000	0	5700	840	4200	2400	0	2690	7840

Notes

* Values listed reflect the combined standards for the cis and trans isomers of 1,3-Dichloroprope

U - *The compound was not detected at the indicated concentration.*

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

NR - Not analyzed.

Dup Duplicate sample of SB2-15,5-16

Dup2 Duplicate sample of SB9-1 5-2

Dup3 Duplicate sample of SB12-12 5-13

TABLE 3

Summary Analytical Results of Volatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB12-1 5-2	SB12-12 5-13	SB12-31-31.5	Dup	Dup-2	Dup3
Lab Sample Number				34689	34690	34691	34369	34538	34692
Sampling Date				12/05/97	12/05/97	12/05/97	12/03/97	12/04/97	12/05/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				50.0	50.0	50.0	50.0	50.0	50.0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)						
VOLATILE COMPOUNDS (GC/MS)									
Chloromethane	520,000	1,000,000	10,000	140 U	120 U	130 U	140 U	150 U	120 U
Bromomethane	79,000	1,000,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
VinylChloride	2,000	7,000	10 000	140 U	120 U	130 U	140 U	150 U	120 U
Chloroethane	NA	NA	NA	140 U	120 U	130 U	140 U	150 U	120 U
MethyleneChloride	49,000	210,000	1,000	230 B	110 JB	180 B	140 U	180 B	240 B
Acetone	1,000,000	1,000,000	100,000	690 U	630 U	660 U	700 U	770 U	600 U
CarbonDisulfide	NA	NA	NA	130 J	120 U	130 U	140 U	150 U	120 U
1 1-Dichloroethene	8,000	150,000	10,000	140 U	120 U	130 U	140 U	150 U	120 U
1,1-Dichloroethane	570,000	1,000 000	10,000	140 U	120 U	130 U	140 U	150 U	120 U
trans-1,2 Dichloroethene	1,000,000	1 000,000	50,000	140 U	120 U	130 U	140 U	150 U	120 U
cis 1,2-Dichloroethene	79,000	1,000,000	1 000	140 U	120 U	130 U	140 U	150 U	120 U
Chloroform	19,000	28,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
1,2-Dichloroethane	6 000	24,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
2-Butanone	1,000,000	1,000,000	50 000	690 U	630 U	660 U	700 U	770 U	600 U
1 1,1-Trichloroethane	210,000	1,000,000	50,000	140 U	120 U	130 U	140 U	150 U	120 U
Carbon Tetrachloride	2,000	4,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
Bromodichloromethane	11,000	48,000	1 000	140 U	120 U	130 U	140 U	150 U	120 U
1,2 Dichloropropane	10 000	43,000	NA	140 U	120 U	130 U	140 U	150 U	120 U
cis-1,3 Dichloropropene	4,000	5,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
Trichloroethene	23,000	54,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
Dibromochloromethane	110 000	1,000 000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
1,1,2-Trichloroethane	22,000	420,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
Benzene	3,000	13,000	1 000	140 U	260	130 U	140 U	150 U	240
trans-1,3-Dichloropropene	4,000	5,000	1 000	140 U	120 U	130 U	140 U	150 U	120 U
Bromoform	88,000	370,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
4-Methyl-2-Pentanone	1,000,000	1,000,000	50,000	690 U	630 U	660 U	700 U	770 U	600 U
2 Hexanone	NA	NA	NA	690 U	630 U	660 U	700 U	770 U	600 U
Tetrachloroethene	4,000	6,000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
1 1,2,2-Tetrachloroethane	34,000	70,000	1 000	140 U	120 U	130 U	140 U	150 U	120 U
Toluene	1,000,000	1,000 000	500,000	140 U	94 J	130 U	140 U	150 U	100 J
Chlorobenzene	37,000	680 000	1,000	140 U	120 U	130 U	140 U	150 U	120 U
Ethylbenzene	1,000 000	1,000,000	100,000	140 U	87 J	130 U	140 U	150 U	82 J
Styrene	23,000	97,000	100,000	140 U	120 U	130 U	140 U	150 U	120 U
Xylene(Total)	410,000	1,000,000	10,000	140 U	82 J	73 J	140 U	81 J	100 J
Total Confident Conc. VOAs (s)				0	260	0	0	0	240
Total Estimated Conc. VOA TICs (s)				3800	750	0	5000	3100	0

Notes

* Values listed reflect the combined standards for the cis and trans isomers of 1,3-Dichloroprope

U - The compound was not detected at the indicated concentration.

J - Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

B - The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample

NR - Not analyzed

Dup Duplicate sample of SB2-15.5 16

Dup2 Duplicate sample of SB9-1 5-2

Dup3 Duplicate sample of SB12-12.5-13

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

ple ID / Sample Depth				SB1-1 5-2	SB1-11 5-12	SB1-19.5 20	SB2-1 5-2	SB2-15.5-20	SB2-19 5-20	SB3-1 5-2	SB3-10-10.5	SB3-19 5-20	SB4-1.5-2
Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370
ling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
on Factor				1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)										
IVOLATILE COMPOUNDS (GC/MS)													
Phenol	10,000 000	10 000,000	50,000	390 U	750 U	400 U	380 U	430 U	400 U	44 J	400 U	400 U	380 U
2-Chlorophenol	280,000	5,200,000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2-Methylphenol	2 800 000	10 000,000	NA	390 U	750 U	400 U	380 U	15 J	400 U	16 J	400 U	400 U	380 U
4-Methylphenol	2 800,000	10,000,000	NA	31 J	26 J	400 U	380 U	76 J	400 U	58 J	16 J	400 U	18
2-Nitrophenol	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2,4-Dimethylphenol	1,100,000	10,000,000	10,000	12 J	750 U	400 U	380 U	14 J	400 U	380 U	400 U	400 U	380 U
2,4-Dichlorophenol	170,000	3,100 000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
4-Chloro-3-methylphenol	10,000,000	10,000,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2 4,6-Trichlorophenol	62,000	270,000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2 4 5-Trichlorophenol	5,800,000	10,000,000	50,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2 4-Dinitrophenol	110,000	2,100,000	10 000	780 U	1500 U	790 U	760 U	860 U	790 U	770 U	800 U	800 U	760 U
4-Nitrophenol	NA	NA	NA	780 U	1500 U	790 U	760 U	860 U	790 U	770 U	800 U	800 U	760 U
4 6 Dinitro-2-methylphenol	NA	NA	NA	780 U	1500 U	790 U	760 U	860 U	790 U	770 U	800 U	800 U	760 U
Pentachlorophenol	6,000	24,000	100,000	780 U	1500 U	790 U	760 U	860 U	790 U	770 U	800 U	800 U	760 U
bis(2-Chloroethyl)ether	660	3,000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
1,3 Dichlorobenzene	5,100,000	10,000,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
1 4-Dichlorobenzene	570 000	10,000,000	100 000	390 U	750 U	400 U	380 U	430 U	400 U	88 J	400 U	400 U	27 J
1 2-Dichlorobenzene	5,100 000	10,000 000	50,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
bis(2-chloroisopropyl)ether	2 300 000	10,000 000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
N-Nitroso di n propylamine	660	660	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Hexachloroethane	6,000	100,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Nitrobenzene	28,000	520,000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Isophorone	1,100,000	10,000,000	50,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
bis(2-Chloroethoxy)methane	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
1,2 4-Trichlorobenzene	68,000	1,200,000	100 000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Naphthalene	230,000	4,200 000	100,000	400	1000	20 U	53	180	20 U	2300	41	20 U	470
4-Chloroaniline	230 000	4,200,000	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Hexachlorobutadiene	1,000	21,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
2-Methylnaphthalene	NA	NA	NA	250 J	510 J	400 U	59 J	97 J	400 U	3000	34 J	400 U	500
Hexachlorocyclopentadiene	400,000	7,300 000	100 000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380
2-Chloronaphthalene	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380
2 Nitroaniline	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Dimethylphthalate	10 000,000	10 000 000	50,000	390 U	750 U	400 U	380 U	430 U	400 U	380 J	400 U	400 U	380 U
Acenaphthylene	NA	NA	NA	140	140	20 U	8 7 J	380	20 U	420	220	20 U	150
2,6-Dinitrotoluene	1,000	4 000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
3-Nitroaniline	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Acenaphthene	3,400,000	10,000,000	100,000	33	2000	20 U	19 U	280	20 U	370	160	20 U	52
Dibenzofuran	NA	NA	NA	850	1200	400 U	33 J	220 J	400 U	1600	100 J	400 U	410
2 4-Dinitrotoluene	1,000	4 000	10,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Diethylphthalate	10 000,000	10,000,000	50 000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
4-Chlorophenyl-phenylether	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Fluorene	2 300,000	10,000,000	100,000	39	1600	20 U	15 J	300	20 U	240	190	20 U	65
4-Nitroaniline	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
N-Nitrosodiphenylamine	140,000	600,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
4-Bromophenyl-phenylether	NA	NA	NA	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Hexachlorobenzene	660	2,000	100 000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Phenanthrene	NA	NA	NA	880	15000	8 1 J	230	2800	20 U	4800	1700	20 U	1300
Anthracene	10,000,000	10,000,000	100,000	620	2800	20 U	9 2 J	630	20 U	1000	560	20 U	200
Carbazole	NA	NA	NA	260 J	1200	400 U	380 U	420 J	400 U	210 J	170 J	400 U	92 J
Di n-butylphthalate	5 700,000	10,000 000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U

See footnotes on next page

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB1-1 5-2	SB1-11 5-12	SB1-19 5-20	SB2-1.5-2	SB2-15 5-20	SB2-19.5-20	SB3-1.5-2	SB3-10-10.5	SB3-19 5-20	SB4-1.5 2
Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370
pling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
lx				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
ion Factor				1 0	2 0	1.0	1.0	1 0	1.0	1.0	1.0	1.0	1.0
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
IVOLATILE COMPOUNDS (GC/MS) (con t)													
Fluoranthene	2,300,000	10,000,000	100,000	1000	17000	20 U	110	4300	11 J	4200	3300	20 U	1300
Pyrene	1,700 000	10,000,000	100,000	610	15000	20 U	72	3300	9 1 J	2400	2700	20 U	750
Butylbenzylphthalate	1,100,000	10,000,000	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
3,3'-Dichlorobenzidine	2,000	6,000	100,000	780 U	1500 U	790 U	760 U	860 U	790 U	770 U	800 U	800 U	760 U
Benzo(a)anthracene	900	4 000	500 000	500	5600	12 J	110	2100	20 U	1400	1700	20 U	480
Chrysene	9,000	40,000	500 000	580	7200	20 U	170	2300	20 U	2000	1700	20 U	1200
bis(2-Ethylhexyl)phthalate	49,000	210,000	100,000	390 U	750 U	400 U	380 U	110 JB	260 JB	280 JB	400 U	180 JB	190 JB
Di-n-octylphthalate	1,100,000	10,000,00	100,000	390 U	750 U	400 U	380 U	430 U	400 U	380 U	400 U	400 U	380 U
Benzo(b)fluoranthene	900	4,000	50,000	1700	8800	20 U	120	2700	20 U	3600	1800	20 U	1200
Benzo(k)fluoranthene	900	4,000	500,000	530	3000	20 U	19 J	1000	20 U	1000	790	20 U	340
Benzo(a)pyrene	660	660	100,000	170	7300	20 U	24	2100	20 U	720	1500	20 U	270
Indeno(1 2,3 cd)pyrene	900	4,000	500,000	240	4400	20 U	33	1200	20 U	580	780	20 U	270
Dibenz(a h)anthracene	660	660	100,000	100	870	20 U	16 J	310	20 U	190	200	20 U	94
Benzo(g h i)perylene	NA	NA	NA	140	4100	20 U	32	980	20 U	390	650	20 U	220
al Confident Conc BNAs (s)				8532	99210	0	954	24860	0	31010	17991	0	9281
al Estimated Conc BNA TICs (s)				12740	26900	0	5290	12220	0	45290	4910	0	17650

alues listed reflect the combined standards for the 2 4/2 6-Dinitrotoluene mixture
U - The compound was not detected at the indicated concentration
J - Data indicates the presence of a compound that meets the identification criteria.
The results is less than the quantitation limit but greater than zero.
The concetration given is an approximate value
B - The analyte was found in the laboratory blank as well as the sample
This indicates possible laboratory contamination of the environmental sample
NA Not available
NR - Not analyzed
Dup - Duplicate sample of SB2-15 5-16.
Dup2 - Duplicate sample of SB9-1.5-2
Dup3 - Duplicate sample of SB12-12 5-13
[ ] - Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria.

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB4-14.5-15	SB4-23.5-24	SB5-1 5-2	SB5-10 5-11	SB5-23.5-24	SB6-2.5-3	SB6-12.5-13	SB6-23 5-24	SB7-1.5-2	SB7-19.5-20
Sample Number				34371	34372	34529	34530	34531	34532	34533	34534	34539	34540
pling Date				12/03/97	12/03/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
rix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
tion Factor				1.0	1.0	1.0	1.0	1 0	1.0	5.0	1.0	1.0	1 0
s				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)										
IVOLATILE COMPOUNDS (GC/MS)													
Phenol	10,000,000	10,000,000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	11 J	390 U	380 U
2-Chlorophenol	280,000	5,200,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2-Methylphenol	2 800,000	10,000,000	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
4-Methylphenol	2 800,000	10 000,000	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	16 J	390 U	380 U
2-Nitrophenol	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2,4-Dimethylphenol	1,100,000	10,000,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2 4-Dichlorophenol	170 000	3,100 000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
4 Chloro-3-methylphenol	10,000,000	10,000,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2 4 6-Trichlorophenol	62,000	270,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2,4 5-Trichlorophenol	5,600 000	10,000 000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2,4-Dinitrophenol	110,000	2,100,000	10,000	770 U	820 U	770 U	780 U	820 U	750 U	3900 U	770 U	780 U	770 U
4-Nitrophenol	NA	NA	NA	770 U	820 U	770 U	780 U	820 U	750 U	3900 U	770 U	780 U	770 U
4 6-Dinitro-2-methylphenol	NA	NA	NA	770 U	820 U	770 U	780 U	820 U	750 U	3900 U	770 U	780 U	770 U
Pentachlorophenol	6,000	24,000	100,000	770 U	820 U	770 U	780 U	820 U	750 U	3900 U	770 U	780 U	770 U
bis(2-Chloroethyl)ether	660	3,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
1,3-Dichlorobenzene	5,100,000	10,000 000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
1 4-Dichlorobenzene	570 000	10,000,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
1 2 Dichlorobenzene	5,100,000	10,000,000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
bis(2-chloroisopropyl)ether	2,300 000	10,000,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
N-Nitroso di-n-propylamine	660	660	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Hexachloroethane	6,000	100,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Nitrobenzene	28,000	520,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Isophorone	1,100,000	10,000,000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
bis(2 Chloroethoxy)methane	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
1 2,4-Trichlorobenzene	68,000	1,200,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Naphthalene	230,000	4 200,000	100,000	19 U	20 U	19 U	57	20 U	19 U	1000	320	200	19 U
4-Chloroaniline	230 000	4,200,000	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Hexachlorobutadiene	1 000	21,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2-Methylnaphthalene	NA	NA	NA	380 U	410 U	380 U	39 J	410 U	380 U	560 J	130 J	300 J	380 U
Hexachlorocyclopentadiene	400,000	7 300,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2-Chloronaphthalene	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
2-Nitroaniline	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Dimethylphthalate	10,000,000	10,000,000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Acenaphthylene	NA	NA	NA	19 U	20 U	14 J	97	20 U	19 U	110	31	99	19 U
2,6-Dinitrotoluene	1,000	4 000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
3-Nitroaniline	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Acenaphthene	3,400 000	10,000,000	100 000	14 J	20 U	15 J	200	20 U	9.5 J	3300	300	19 U	19 U
Dibenzofuran	NA	NA	NA	380 U	410 U	9 8 J	100 J	410 U	380 U	2200	230 J	230 J	380 U
2 4-Dinitrotoluene	1,000	4,000	10,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Diethylphthalate	10,000,000	10,000,000	50,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
4-Chlorophenyl-phenylether	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Fluorene	2,300 000	10,000,000	100,000	9 0 J	20 U	16 J	190	20 U	8 4 J	3400	240	42	19 U
4 Nitroaniline	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
N-Nitrosodiphenylamine	140,000	600 000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	78 J	380 U	390 U	380 U
4-Bromophenyl-phenylether	NA	NA	NA	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Hexachlorobenzene	660	2,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Phenanthrene	NA	NA	NA	130	20 U	210	1800	20 U	120	26000	2200	850	19 U
Anthracene	10,000,000	10,000,000	100,000	30	20 U	47	520	20 U	25	8100	460	180	19 U
Carbazole	NA	NA	NA	14 J	410 U	19 J	150 J	410 U	380 U	3700	220 J	75 J	380 U
Di-n butylphthalate	5,700 000	10,000 000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U

See footnotes on next page

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

nple ID / Sample Depth				SB4-14.5-15	SB4-23.5-24	SB5-1 5-2	SB5-10.5-11	SB5-23.5-24	SB6-2.5-3	SB6-12.5-13	SB6-23.5-24	SB7-1.5-2.	SB7-19 5-20
Sample Number				34371	34372	34529	34530	34531	34532	34533	34534	34539	34540
npling Date				12/03/97	12/03/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
rix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
tion Factor				1.0	1.0	1.0	1.0	1.0	1.0	5.0	1.0	1.0	1.0
ts				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)										
MIVOLATILE COMPOUNDS (GC/MS) (con t)													
Fluoranthene	2,300,000	10,000,000	100,000	160	20 U	320	2600	20 U	150	26000	2200	750	25
Pyrene	1,700,000	10,000,000	100,000	150	20 U	340	2700	20 U	150	26000	2100	720	25
Butylbenzylphthalate	1,100,000	10,000,000	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
3,3'-Dichlorobenzidine	2,000	8,000	100,000	770 U	820 U	770 U	780 U	820 U	750 U	3900 U	770 U	780 U	770 U
Benzo(a)anthracene	900	4,000	500,000	79	20 U	190	1100	20 U	71	10000	850	290	22
Chrysene	9,000	40,000	500,000	80	20 U	230	1300	20 U	76	11000	980	730	13 J
bis(2-Ethylhexyl)phthalate	49,000	210,000	100,000	380 U	650 B	380 U	390 U	410 U	380 U	1900 U	2300	390 U	380 U
Di-n-octylphthalate	1,100,000	10,000,00	100,000	380 U	410 U	380 U	390 U	410 U	380 U	1900 U	380 U	390 U	380 U
Benzo(b)fluoranthene	900	4,000	50,000	96	20 U	260	1400	20 U	79	12000	1100	800	19 J
Benzo(k)fluoranthene	900	4 000	500,000	40	20 U	99	530	20 U	32	4800	420	270	8 9 J
Benzo(a)pyrene	660	660	100,000	79	20 U	210	1200	20 U	61	10000	860	200	15 J
Indeno(1,2,3-cd)pyrene	900	4,000	500,000	59	20 U	130	700	20 U	34	5900	450	170	19 U
Dibenz(a h)anthracene	660	660	100,000	15 J	20 U	35	180	20 U	19 U	1200	110	57	19 U
Benzo(g h i)perylene	NA	NA	NA	55	20 U	120	730	20 U	30	5100	440	140	19 U
al Confident Conc. BNAs (s)				958	0	2191	15304	0	636	159910	15381	5586	72
al Estimated Conc. BNA TICs (s)				0	0	0	2770	0	0	36800	9090	10550	0

alues listed reflect the combined standards for the 2,4/2,6-Dinitrotoluene mixture
U - The compound was not detected at the indicated concentration
J - Data indicates the presence of a compound that meets the identification criteria
The results is less than the quantitation limit but greater than zero.
The concetration given is an approximate value
B - The analyte was found in the laboratory blank as well as the sample
This indicates possible laboratory contamination of the environmental sample.
NA Not available
NR - Not analyzed.
Dup - Duplicate sample of SB2-15.5-16.
up2 - Duplicate sample of SB9-1 5-2.
up3 - Duplicate sample of SB12-12.5 13
- Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria.

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB7-27.5-28	SB8-1 5-2	SB8-16.5-16	SB8-27 5-28	SB9-1 5-2	SB9-16-16 5	SB9-24-24 5	SB10-1 5-2	SB10-11-11 5	SB10 31 5-32
Sample Number				34541	34542	34543	34544	34545	34546	34547	34548	34549	34550
pling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
rix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
tion Factor				1 0	1.0	1.0	1.0	1.0	5 0	1 0	1.0	1.0	1.0
s				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)										
VIVOLATILE COMPOUNDS (GC/MS)													
Phenol	10,000,000	10,000,000	50 000	57 J	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2 Chlorophenol	280,000	5,200,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2-Methylphenol	2,800,000	10,000,000	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
4-Methylphenol	2,800,000	10,000,000	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2-Nitrophenol	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2,4-Dimethylphenol	1,100,000	10,000,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2,4-Dichlorophenol	170,000	3,100,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
4-Chloro-3-methylphenol	10,000,000	10,000,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2,4 5-Trichlorophenol	62,000	270,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2,4,5-Trichlorophenol	5,600 000	10,000,000	50,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2 4-Dinitrophenol	110,000	2,100 000	10,000	810 U	790 U	730 U	760 U	780 U	3700 U	820 U	810 U	790 U	790 U
4-Nitrophenol	NA	NA	NA	810 U	790 U	730 U	760 U	780 U	3700 U	820 U	810 U	790 U	790 U
4 6-Dinitro-2-methylphenol	NA	NA	NA	810 U	790 U	730 U	760 U	780 U	3700 U	820 U	810 U	790 U	790 U
Pentachlorophenol	6,000	24 000	100,000	810 U	790 U	730 U	760 U	780 U	3700 U	820 U	810 U	790 U	790 U
bis(2-Chloroethyl)ether	660	3,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
1,3-Dichlorobenzene	5,100,000	10,000,000	100 000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
1,4-Dichlorobenzene	570,000	10 000,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
1 2 Dichlorobenzene	5,100 000	10,000,000	50,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
bis(2-chloroisopropyl)ether	2,300,000	10,000,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
N Nitroso-di-n-propylamine	660	660	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Hexachloroethane	6,000	100,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Nitrobenzene	28,000	520,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Isophorone	1,100 000	10,000,000	50,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
bis(2-Chloroethoxy)methane	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
1 2 4 Trichlorobenzene	68,000	1,200 000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Naphthalene	230,000	4,200,000	100,000	27	71	27	19 U	100	1300	180	33	20 U	20 U
4-Chloroaniline	230,000	4,200,000	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Hexachlorobutadiene	1,000	21,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2-Methylnaphthalene	NA	NA	NA	24 J	130 J	15 J	380 U	120 J	1000 J	140 J	64 J	390 U	400 U
Hexachlorocyclopentadiene	400,000	7,300,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2 Chloronaphthalene	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
2-Nitroaniline	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Dimethylphthalate	10,000,000	10,000,000	50,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Acenaphthylene	NA	NA	NA	33	11 J	13 J	19 U	20	87 J	76	23	20 U	20 U
2 6-Dinitrotoluene	1,000	4,000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
3 Nitroaniline	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Acenaphthene	3,400,000	10,000,000	100,000	9.3 J	20 U	57	19 U	94	4900	520	14 J	20 U	15 J
Dibenzofuran	NA	NA	NA	34 J	59 J	31 J	380 U	130 J	2700	240 J	26 J	390 U	400 U
2,4-Dinitrotoluene	1,000	4 000	10,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Diethylphthalate	10 000,000	10,000,000	50 000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
4-Chlorophenyl phenylether	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Fluorene	2,300 000	10,000,000	100,000	24	20 U	57	19 U	92	3600	400	16 J	20 U	20 U
4-Nitroaniline	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
N-Nitrosodiphenylamine	140 000	600,000	100 000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
4 Bromophenyl-phenylether	NA	NA	NA	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Hexachlorobenzene	660	2,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Phenanthrene	NA	NA	NA	280	270	600	12 J	1100	26000	3800	220	57	94
Anthracene	10,000,000	10,000,000	100,000	66	22	130	19 U	200	7700	1000	31	13 J	22
Carbazole	NA	NA	NA	28 J	18 J	59 J	380 U	150 J	2900	330 J	17 J	390 U	400 U
Di-n butylphthalate	5,700 000	10,000,000	100 000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U

See footnotes on next page

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB7-27.5 28	SB8-1.5-2	SB8-16 5-16	SB8-27.5-28	SB9-1.5-2	SB9-16-16.5	SB9-24-24 5	SB10-1 5-2	SB10-11-11 5	SB10-31.5-32
Sample Number				34541	34542	34543	34544	34545	34546	34547	34548	34549	34550
pling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
rix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
tion Factor				1.0	1.0	1 0	1.0	1.0	5.0	1 0	1.0	1 0	1.0
s				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)										
MIVOLATILE COMPOUNDS (GC/MS) (con t)													
Fluoranthene	2,300,000	10,000,000	100,000	340	110	590	38	980	23000	4300	180	83	140
Pyrene	1 700,000	10,000,000	100,000	330	89	590	42	890	23000	4800	170	81	140
Butylbenzylphthalate	1,100,000	10,000,000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
3,3 -Dichlorobenzidine	2,000	6 000	100,000	810 U	790 U	730 U	760 U	780 U	3700 U	820 U	810 U	790 U	790 U
Benzo(a)anthracene	900	4,000	500,000	230	40	230	21	400	8600	1900	82	40	70
Chrysene	9,000	40,000	500,000	290	120	250	12 J	650	8700	2100	140	38	86
bis(2-Ethylhexyl)phthalate	49,000	210 000	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	980	400 U	390 U	360 J
Di n-octylphthalate	1,100,000	10,000,00	100,000	400 U	400 U	370 U	380 U	390 U	1900 U	410 U	400 U	390 U	400 U
Benzo(b)fluoranthene	900	4,000	50,000	340	94	290	17 J	670	9700	2300	120	40	88
Benzo(k)fluoranthene	900	4,000	500,000	140	35	100	19 U	200	3800	880	38	20 U	35
Benzo(a)pyrene	660	660	100,000	240	35	220	11 J	290	7700	1800	76	32	60
Indeno(1,2,3 cd)pyrene	900	4,000	500,000	130	26	100	19 U	170	3800	990	35	20 U	30
Dibenz(a,h)anthracene	660	660	100,000	42	10 J	44	19 U	59	830	230	20 U	20 U	20 U
Benzo(g h i)perylene	NA	NA	NA	99	27	110	19 U	130	3400	970	36	20 U	29
al Confident Conc BNAs (s)				2611	939	3395	101	6025	141630	27228	1184	371	794
al Estimated Conc BNA TICs (s)				430	1370	560	0	1210	30700	11780	0	0	0

alues listed reflect the combined standards for the 2,4/2,6-Dinitrotoluene mixture.
U - The compound was not detected at the indicated concentration
J - Data indicates the presence of a compound that meets the identification criteria
The results is less than the quantitation limit but greater than zero.
The concetration given is an approximate value
B - The analyte was found in the laboratory blank as well as the sample
This indicates possible laboratory contamination of the environmental sample
NA Not available
NR - Not analyzed
Dup - Duplicate sample of SB2-15 5-16.
Dup2 - Duplicate sample of SB9-1 5-2
Dup3 - Duplicate sample of SB12-12.5-13
[ ] - *Concentration exceeds NJDEP Residential Direct Contact* Soil Cleanup Criteria

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB11-3-3.5	SB11-22-22.5	SB11-31.5-32	SB12-1.5-2	SB12-12.5-13	SB12-31-31.5	Dup	Dup2	Dup3
Sample Number				34693	34694	34695	34689	34690	34691	34369	34536	34692
pling Date				12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/03/97	12/04/97	12/05/97
ix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
ion Factor				1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)									
IVOLATILE COMPOUNDS (GC/MS)												
Phenol	10,000,000	10,000,000	50,000	15 J	17 J	42 J	400 U	390 U	390 U			
2-Chlorophenol	280,000	5,200,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	120 J	410 U	27 J
2-Methylphenol	2,800,000	10,000,000	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
4-Methylphenol	2,800,000	10,000,000	NA	19 J	18 J	63 J	400 U	22 J	15 J	48 J	410 U	26 J
2-Nitrophenol	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	200 J	410 U	61 J
2,4-Dimethylphenol	1,100,000	10,000,000	10,000	9.3 J	420 U	410 U	400 U	8.2 J	390 U	410 U	410 U	360 U
2,4-Dichlorophenol	170,000	3,100,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	55 J	410 U	360 U
4-Chloro-3-methylphenol	10,000,000	10,000,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
2,4,6-Trichlorophenol	62,000	270,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
2,4,5-Trichlorophenol	5,600,000	10,000,000	50,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
2,4-Dinitrophenol	110,000	2,100,000	10,000	840 U	830 U	830 U	790 U	770 U	780 U	410 U	410 U	360 U
4-Nitrophenol	NA	NA	NA	840 U	830 U	830 U	790 U	770 U	780 U	820 U	810 U	730 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	840 U	830 U	830 U	790 U	770 U	780 U	820 U	810 U	730 U
Pentachlorophenol	6,000	24,000	100,000	840 U	830 U	830 U	790 U	770 U	780 U	820 U	810 U	730 U
bis(2-Chloroethyl)ether	660	3,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	820 U	810 U	730 U
1,3-Dichlorobenzene	5,100,000	10,000,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
1,4-Dichlorobenzene	570,000	10,000,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
1,2-Dichlorobenzene	5,100,000	10,000,000	50,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
bis(2-chloroisopropyl)ether	2,300,000	10,000,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
N-Nitroso-di-n-propylamine	660	660	10,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Hexachloroethane	6,000	100,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Nitrobenzene	28,000	520,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Isophorone	1,100,000	10,000,000	50,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
bis(2-Chloroethoxy)methane	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
1,2,4-Trichlorobenzene	68,000	1,200,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Naphthalene	230,000	4,200,000	100,000	160	130	3000	120	130	51	410 U	410 U	360 U
4-Chloroaniline	230,000	4,200,000	NA	420 U	420 U	410 U	400 U	390 U	390 U	440	50	400
Hexachlorobutadiene	1,000	21,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
2-Methylnaphthalene	NA	NA	NA	120 J	50 J	390 J	200 J	120 J	27 J	410 U	410 U	360 U
Hexachlorocyclopentadiene	400,000	7,300,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	200 J	110 J	210 J
2-Chloronaphthalene	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
2-Nitroaniline	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Dimethylphthalate	10,000,000	10,000,000	50,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Acenaphthylene	NA	NA	NA	110	69	1000	20 U	55	27	410 U	410 U	360 U
2,6-Dinitrotoluene	1,000	4,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	710	42	180
3-Nitroaniline	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Acenaphthene	3,400,000	10,000,000	100,000	650	95	360	20 U	500	51	410 U	410 U	360 U
Dibenzofuran	NA	NA	NA	400 J	72 J	590	90 J	320 J	45 J	430	12 J	610
2,4-Dinitrotoluene	1,000	4,000	10,000	420 U	420 U	410 U	400 U	390 U	390 U	350 J	38 J	400
Diethylphthalate	10,000,000	10,000,000	50,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
4-Chlorophenyl phenylether	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Fluorene	2,300,000	10,000,000	100,000	540	100	970	20 U	400	54	410 U	410 U	360 U
4-Nitroaniline	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	470	14 J	840
N-Nitrosodiphenylamine	140,000	600,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
4-Bromophenyl-phenylether	NA	NA	NA	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Hexachlorobenzene	660	2,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	410 U	410 U	360 U
Phenanthrene	NA	NA	NA	6800	810	4400	490	3900	420	410 U	410 U	360 U
Anthracene	10,000,000	10,000,000	100,000	1600	190	1400	16 J	640	94	4400	300	4500
Carbazole	NA	NA	NA	450	81 J	270 J	15 J	350 J	42 J	930	38	1000
Di-n-butylphthalate	5,700,000	10,000,000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	560	33 J	410

See footnotes on next page

Table 4

Summary Analytical Results of Semivolatile Organic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey.

ple ID / Sample Depth				SB11-3-3 5	SB11-22-22 5	SB11-31.5-32	SB12-1.5-2	SB12-12.5-13	SB12-31-31.5	Dup	Dup2	Dup3
Sample Number				34693	34694	34695	34689	34690	34691	34389	34538	34692
pling Date				12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/03/97	12/04/97	12/05/97
rix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
tion Factor				1 0	1.0	1 0	1.0	1.0	1.0	1.0	1.0	1 0
s				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)									
IIVOLATILE COMPOUNDS (GC/MS) (con t)												
Fluoranthene	2,300,000	10,000,000	100,000	7300	1000	7700	220	4100	550	410 U	410 U	350 U
Pyrene	1,700,000	10,000,000	100,000	6300	910	7400	150	3600	470	7200	200	4700
Butylbenzylphthalate	1,100 000	10,000,000	100 000	420 U	420 U	410 U	400 U	390 U	390 U	6400	220	4200
3 3'-Dichlorobenzidine	2 000	6,000	100,000	840 U	830 U	830 U	790 U	770 U	780 U	410 U	410 U	360 U
Benzo(a)anthracene	900	4,000	500,000	3000	490	4200	82	1500	240	820 U	810 U	730 U
Chrysene	9,000	40 000	500,000	3000	530	5000	250	1700	280	3700	150	1900
bis(2-Ethylhexyl)phthalate	49,000	210 000	100,000	420 U	420 U	410 U	400 U	390 U	390 U	4100	250	2000
Di-n-octylphthalate	1,100,000	10 000,00	100,000	420 U	420 U	410 U	400 U	390 U	390 U	170 JB	410 U	200 J
Benzo(b)fluoranthene	900	4,000	50,000	3100	560	9100	200	1700	270	410 U	410 U	360 U
Benzo(k)fluoranthene	900	4,000	500,000	1100	220	3100	42	600	100	5800	290	2000
Benzo(a)pyrene	660	660	100,000	2600	450	7000	45	1300	200	2100	90	800
Indeno(1 2,3-cd)pyrene	900	4,000	500,000	1500	280	5000	70	820	130	4600	160	1800
Dibenz(a,h)anthracene	660	660	100 000	340	65	1200	28	200	34	2500	110	1100
Benzo(g h i)perylene	NA	NA	NA	1200	260	3900	69	830	130	620	47	760
al Confident Conc BNAs (s)				39750	6159	85320	1788	21975	3101	2000	100	1000
al Estimated Conc BNA TICs (s)				10900	4250	22170	14250	9790	1400	46960	2047	27800

alues listed reflect the combined standards for the 2,4/2,6-Dinitrotoluene mixture.
U - The compound was not detected at the indicated concentration
J - Data indicates the presence of a compound that meets the identification criteria
The results is less than the quantitation limit but greater than zero.
The concentration given is an approximate value.
B - The analyte was found in the laboratory blank as well as the sample
This indicates possible laboratory contamination of the environmental sample
NA Not available
R - Not analyzed
Dup - Duplicate sample of SB2-15 5-16.
up2 - Duplicate sample of SB9-1.5-2
up3 - Duplicate sample of SB12-12.5-13
- Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria.

Table 5

Summary Analytical Results of Pesticides and Polychlorinated Biphenyl Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB1-1.5-2	SB1-11.5-12	SB1-19.5-20	SB2-1.5-2	SB2-15.5-16	SB2-19.5-20	SB3-1.5-2.0	SB3-10-10.5	SB3-19.5-20	SB4-1.5-2.0	SB4-14.5-15	SB4-23.5-24
Lab Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370	34371	34372
Sampling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				1.0	1.0	1.0	1.0	1.0	1.0	10.0	1.0	1.0	1.0	1.0	1.0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
		New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)											
PESTICIDES/PCBs															
	Aldrin	40	170	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	alpha-BHC	NA	NA	NA	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	beta BHC	NA	NA	NA	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	delta-BHC	NA	NA	NA	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	gamma-BHC(Lindane)	520	2,200	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Chlordane	NA	NA	NA	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
	4 4'-DDD	3,000	12,000	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	130	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	4 4'-DDE	2,000	9,000	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	53	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	4,4-DDT	2,000	9,000	500,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	540	4.0 U	4.0 U	14	3.8 U	4.1 U
	Dieldrin	42	180	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
**	Endosulfan I	340,000	6,200,000	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
**	Endosulfan II	340,000	6,200,000	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Endosulfansulfate	NA	NA	NA	3.9 U	5.6 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Endrin	17,000	310,000	50,000	5.0 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Endrinaldehyde	NA	NA	NA	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Endrinketone	NA	NA	NA	7.4 U	40 U	4.0 U	3.8 U	5.2 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Heptachlor	150	650	50,000	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Heptachlorepoxide	NA	NA	NA	3.9 U	3.8 U	4.0 U	3.8 U	4.3 U	4.0 U	38 U	4.0 U	4.0 U	3.8 U	3.8 U	4.1 U
	Methoxychlor	280,000	5,200,000	50,000	3.9 U	182 U	4.0 U	3.8 U	35 U	4.0 U	38 U	55 U	4.0 U	3.8 U	3.8 U	4.1 U
	Toxaphene	100	200	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1016	490	2,000	50 000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1221	490	2,000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1232	490	2,000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1242	490	2,000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1248	490	2 000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1254	490	2,000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U
*	Aroclor-1260	490	2,000	50,000	80 U	76 U	80 U	77 U	87 U	81 U	780 U	82 U	81 U	77 U	78 U	84 U

Notes
* Values listed reflect the combined standards for "Total PCBs"
** Soil Cleanup criteria is provided for "Endosulfan" without specification if it is for Endosulfan I or Endosulfan II
Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1 5-2
Dup3 Duplicate sample of SB12-12.5-13
U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than or equal to the Instrument Detection Limit.
N - The spiked sample recovery is not within control limits.
NR - Not analyzed.
NA- Not available

Table 5

Summary Analytical Results of Pesticides and Polychlorinated Biphenyl Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB5-1 5-2	SB5-10.5-11	SB5-23 5-24	SB6-2.5-3	SB6-12 5-13	SB6-23 5-24	SB7-1 5-2	SB7-19.5-20	SB7-27 5-28	SB8-1 5-2	SB8-15 5-16	SB8-27 5-28
Lab Sample Number				34529	34530	34531	34532	34533	34534	34539	34540	34541	34542	34543	34544
Sampling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				1 0	1 0	1.0	1 0	1 0	1.0	1 0	1 0	1 0	1.0	1 0	1 0
Units				ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)												
PESTICIDES/PCBs															
Aldrin	40	170	50,000	3 8 U	3 9 U	4.1 U	3 8 U	3 9 U	3 8 U	3 9 U	3 8 U	4.0 U	4 0 U	3.7 U	3 8 U
alpha BHC	NA	NA	NA	3 8 U	3.9 U	4.1 U	3.8 U	3 9 U	3.8 U	3 9 U	3.8 U	4 0 U	4.0 U	3 7 U	3.8 U
beta-BHC	NA	NA	NA	3.8 U	3 9 U	4 1 U	3 8 U	3 9 U	3.8 U	3 9 U	3.8 U	4 0 U	4 0 U	3.7 U	3 8 U
delta-BHC	NA	NA	NA	3.8 U	3.9 U	4 1 U	3 8 U	3 9 U	3 8 U	3.9 U	3.8 U	4 0 U	4 0 U	3 7 U	3.8 U
gamma-BHC(Lindane)	520	2,200	50,000	3.8 U	3.9 U	4 1 U	3 8 U	3 9 U	3 8 U	3.9 U	3.8 U	4 0 U	4 0 U	3 7 U	3 8 U
Chlordane	NA	NA	NA	78 U	79 U	83 U	76 U	79 U	76 U	79 U	78 U	82 U	80 U	74 U	78 U
4,4 DDD	3,000	12,000	50,000	3.8 U	3 9 U	4 1 U	3 8 U	3 9 U	3 8 U	3 9 U	3 8 U	4 0 U	4 0 U	3 7 U	3.8 U
4,4-DDE	2 000	9,000	50,000	3 8 U	3 9 U	4 1 U	3.8 U	3.9 U	3.8 U	3 9 U	3 8 U	4 0 U	4 0 U	3 7 U	3 8 U
4,4 DDT	2,000	9,000	500,000	3 8 U	3.9 U	4 1 U	3.8 U	3.9 U	3.8 U	8 4 U	3 8 U	4 0 U	4.0 U	3.7 U	3 8 U
Dieldrin	42	180	50,000	3 8 U	3 9 U	4 1 U	3 8 U	3.9 U	3 8 U	3 9 U	3 8 U	4 0 U	4.0 U	3.7 U	3 8 U
** Endosulfan I	340,000	6,200,000	50,000	3.8 U	3 9 U	4 1 U	3 8 U	3 9 U	3.8 U	3.9 U	3.8 U	4.0 U	4 0 U	3.7 U	3.8 U
** Endosulfan II	340,000	6,200,000	50,000	3.8 U	3 9 U	4 1 U	3 8 U	3 9 U	3 8 U	3.9 U	3.8 U	4 0 U	4 0 U	3 7 U	3.8 U
Endosulfansulfate	NA	NA	NA	3.8 U	3 9 U	4 1 U	3 8 U	3 9 U	3.8 U	3.9 U	3 8 U	4 0 U	4 0 U	3 7 U	3.8 U
Endrin	17,000	310,000	50,000	3.8 U	3.9 U	4 1 U	3 8 U	3.9 U	3.8 U	3 9 U	3 8 U	4 0 U	4.0 U	3.7 U	3 8 U
Endrinaldehyde	NA	NA	NA	3.8 U	3.9 U	4 1 U	3.8 U	3.9 U	3.8 U	3 9 U	3 8 U	4 0 U	4.0 U	3 7 U	3 8 U
Endrinketone	NA	NA	NA	3.8 U	3.9 U	4 1 U	3 8 U	3.9 U	3.8 U	6.5 U	3.8 U	4.0 U	4 2 U	3.7 U	3 8 U
Heptachlor	150	650	50,000	3.8 U	3.9 U	4.1 U	3.8 U	3.9 U	3 8 U	7 7 U	3.8 U	4.0 U	4 5 U	3.7 U	3 8 U
Heptachlorepoxide	NA	NA	NA	3 8 U	3.9 U	4.1 U	3.8 U	3 9 U	3.8 U	3.9 U	3.8 U	4.0 U	4 0 U	3.7 U	3.8 U
Methoxychlor	280 000	5,200,000	50,000	3 8 U	3 9 U	4 1 U	3 8 U	3 9 U	3 8 U	28 U	3.8 U	4 0 U	13 U	3.7 U	3 8 U
Toxaphene	100	200	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1016	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1221	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1232	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1242	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1248	490	2,000	50,000	78 U	79 U	83 U	75 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1254	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U
* Aroclor-1260	490	2,000	50,000	78 U	79 U	83 U	76 U	79 U	78 U	79 U	78 U	82 U	80 U	74 U	78 U

Notes

* Values listed reflect the combined standards for "Total PCBs"

** Soil Cleanup criteria is provided for "Endosulfan" without specification if it is for Endosulfan I or Endosulfan II

Dup Duplicate sample of SB2-15.5-16

Dup2 Duplicate sample of SB9-1 5-2

Dup3 Duplicate sample of SB12-12.5-13

U - The compound was not detected at the indicated concentration

B - Reported value is less than the Method Detection Limit but greater than equal to the Instrument Detection Limit.

N - The spiked sample recovery is not within control limits.

NR - Not analyzed.

NA- Not available

Table 5

Summary Analytical Results of Pesticides and Polychlorinated Biphenyl Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB9-1 5-2	SB9-16-16 5	SB9-24-24 5	SB10-1 5-2	SB10-11-11 5	SB10-31 5-32	SB11-3-3.5	SB11-22 22.5	SB11-31-31 5	SB12-1.5-2	SB12-12.5-13	SB12-31-31 5
Lab Sample Number				34545	34546	34547	34548	34549	34550	34693	34694	34695	34689	34690	34691
Sampling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				1 0	1.0		1.0	1.0	1.0	1.0	1 0	1 0	1.0	1 0	1 0
Units				ug/kg	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)												
PESTICIDES/PCBs															
Aldrin	40	170	50,000	3 9 U	3 7 U	NR	4 0 U	3 9 U	4.0 U	4 2 U	4 2 U	4 1 U	4 0 U	3 9 U	3 9 U
alpha-BHC	NA	NA	NA	3 9 U	3 7 U	NR	4.0 U	3 9 U	4 0 U	4 2 U	4 2 U	4 1 U	4.0 U	3 9 U	3 9 U
beta BHC	NA	NA	NA	3.9 U	3 7 U	NR	4 0 U	3 9 U	4 0 U	4 2 U	4 2 U	4 1 U	4 0 U	3.9 U	3 9 U
delta BHC	NA	NA	NA	3 9 U	3 7 U	NR	4.0 U	3 9 U	4.0 U	4 2 U	4 2 U	4 1 U	4.0 U	3.9 U	3 9 U
gamma-BHC(Lindane)	520	2,200	50,000	3 9 U	3.7 U	NR	4 0 U	3.9 U	4.0 U	4 2 U	4 2 U	4 1 U	4.0 U	3.9 U	3 9 U
Chlordane	NA	NA	NA	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
4 4'-DDD	3,000	12 000	50,000	3 9 U	3 7 U	NR	4 0 U	3 9 U	4 0 U	4 2 U	4 2 U	4 1 U	4.0 U	3 9 U	3 9 U
4 4 DDE	2,000	9,000	50,000	3.9 U	3.7 U	NR	4 0 U	3 9 U	4 0 U	4.2 U	4.2 U	4 1 U	4 0 U	3 9 U	3 9 U
4,4' DDT	2,000	9,000	500,000	3 9 U	3.7 U	NR	4 0 U	3 9 U	4 0 U	4.2 U	4.2 U	4 1 U	4 0 U	3 9 U	3.9 U
Dieldrin	42	180	50,000	3 9 U	3.7 U	NR	4 0 U	3.9 U	4 0 U	4 2 U	4 2 U	4 1 U	4 0 U	3 9 U	3.9 U
** Endosulfan I	340,000	6,200,000	50 000	3 9 U	3.7 U	NR	4.0 U	3.9 U	4.0 U	4.2 U	4 2 U	4 1 U	4 0 U	3.9 U	3.9 U
** Endosulfan II	340,000	6,200,000	50,000	3.9 U	3 7 U	NR	4 0 U	3.9 U	4.0 U	4 2 U	4 2 U	4 1 U	4 0 U	3 9 U	3.9 U
Endosulfansulfate	NA	NA	NA	3.9 U	3.7 U	NR	4 0 U	3 9 U	4.0 U	4 2 U	4 2 U	4 1 U	4.0 U	3 9 U	3 9 U
Endrin	17,000	310,000	50,000	3 9 U	3 7 U	NR	4 0 U	3 9 U	4 0 U	4 2 U	4.2 U	4 1 U	4 0 U	3.9 U	3 9 U
Endrinaldehyde	NA	NA	NA	3 9 U	3 7 U	NR	4.0 U	3 9 U	4 0 U	4 2 U	4 2 U	4 1 U	4.0 U	3 9 U	3 9 U
Endrinketone	NA	NA	NA	3 9 U	3 7 U	NR	4 0 U	3.9 U	4.0 U	4 2 U	4 2 U	4 1 U	4 0 U	4 2 U	3 9 U
Heptachlor	150	650	50,000	3.9 U	3.7 U	NR	4 0 U	3.9 U	4.0 U	4 2 U	4.2 U	4 1 U	4 0 U	3 9 U	3 9 U
Heptachlorepoxide	NA	NA	NA	3.9 U	3 7 U	NR	4 0 U	3 9 U	4 0 U	4 2 U	4 2 U	4 1 U	4.0 U	3 9 U	3 9 U
Methoxychlor	280 000	5,200,000	50,000	14 U	3.7 U	NR	16 U	3.9 U	4.0 U	23 U	4 2 U	49 U	4 0 U	34 U	3 9 U
Toxaphene	100	200	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1016	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1221	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1232	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1242	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1248	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1254	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U
* Aroclor-1260	490	2,000	50,000	78 U	76 U	NR	82 U	80 U	80 U	85 U	84 U	84 U	81 U	78 U	79 U

Notes,
* Values listed reflect the combined standards for "Total PCBs"
** Soil Cleanup criteria is provided for "Endosulfan" without specification if it is for Endosulfan I or Endosulfan II
Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1 5-2
Dup3 Duplicate sample of SB12-12 5-13
U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than equal to the Instrument Detection Limit
N - The spiked sample recovery is not within control limits
NR - Not analyzed
NA- Not available

Table 5

Summary Analytical Results of Pesticides and Polychlorinated Biphenyl Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				Dup	Dup-2	Dup3
Lab Sample Number				34359	34538	34692
Sampling Date				12/03/97	12/04/97	12/05/97
Matrix				SOLID	SOLID	SOLID
Dilution Factor				1.0	1.0	1.0
Units				ug/kg	ug/kg	ug/kg
		New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)			
PESTICIDES/PCBs						
	Aldrin	40	170	50,000	4.1 U	4.1 U	3.8 U
	alpha-BHC	NA	NA	NA	4.1 U	4.1 U	3.8 U
	beta BHC	NA	NA	NA	4.1 U	4.1 U	3.8 U
	delta BHC	NA	NA	NA	4.1 U	4.1 U	3.8 U
	gamma-BHC(Lindane)	520	2,200	50,000	4.1 U	4.1 U	3.8 U
	Chlordane	NA	NA	NA	83 U	82 U	74 U
	4,4'-DDD	3,000	12,000	50,000	4.1 U	4.1 U	3.8 U
	4,4' DDE	2,000	9,000	50,000	4.1 U	4.1 U	3.8 U
	4,4'-DDT	2,000	8,000	500,000	4.1 U	4.1 U	3.8 U
	Dieldrin	42	180	50,000	4.1 U	4.1 U	3.8 U
**	Endosulfan I	340,000	6,200,000	50,000	4.1 U	4.1 U	3.8 U
**	Endosulfan II	340,000	6,200,000	50,000	4.1 U	4.1 U	3.8 U
	Endosulfansulfate	NA	NA	NA	4.1 U	4.1 U	3.8 U
	Endrin	17,000	310,000	50,000	4.1 U	4.1 U	3.8 U
	Endrinaldehyde	NA	NA	NA	4.1 U	4.1 U	3.8 U
	Endrinketone	NA	NA	NA	8.6 U	8.4 U	3.8 U
	Heptachlor	150	650	50,000	4.1 U	4.7 U	3.8 U
	Heptachlorepoxide	NA	NA	NA	4.1 U	4.1 U	3.8 U
	Methoxychlor	280,000	5,200,000	60,000	80 U	25 U	24 U
	Toxaphene	100	200	60,000	83 U	82 U	74 U
*	Aroclor-1016	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor-1221	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor-1232	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor-1242	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor-1248	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor-1254	490	2,000	50,000	83 U	82 U	74 U
*	Aroclor 1260	490	2,000	50,000	83 U	82 U	74 U

Notes:
* Values listed reflect the combined standards for "Total PCBs"
** Soil Cleanup criteria is provided for "Endosulfan" without specification if it is for *Endosulfan I or Endosulfan II*
Dup Duplicate sample of SB2-15 5-15
Dup2 Duplicate sample of SB9-1 5-2
Dup3 Duplicate sample of SB12-12 5-13
U - The compound was not detected at the indicated concentration.
B - Reported value is less than the Method Detection Limit but greater than equal to the Instrument Detection Limit.
N - The spiked sample recovery is not within control limits
NR - Not analyzed.
NA- Not available

Table 6

Summary Analytical Results of Inorganic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB1-1 5-2	SB1-11 5-12	SB1-19.5-20	SB2-1.5-2	SB2 15.5-16	SB2 19.5-20	SB3-1.5-2.0	SB3-10-10.5	SB3-19.5-20	SB4-1 5-2 0	SB4 14 5-15
Lab Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370	34371
Sampling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (mg/kg)											
METALS														
Aluminum	NA	NA	NA	1820	5420	8630	2090	5270	8660	1000	9280	11800	847	8300
Antimony	14	340	NA	4 8	0.95 U	1 1 U	1 1 U	1 2 U	1 1 U	8 9	1.0 U	1 1 U	15 7	1 1 U
Arsenic	20	20	NA	17 0	3 6	3.0	14 9	9.2	7 3	15.0	5 5	3 0	23 5	2 0
Barium	700	47,000	NA	32 8 B	68 9	187 B	27 1 B	166	68 6	44 9	96.2	53 3	42.8 B	65 6
Beryllium	1	1	NA	0 37 B	0 36 B	0.43 B	0.53	0 36 B	0.54	0.28 B	0 44 B	0.84	0.36 B	0 48
Cadmium	1	100	NA	0.085 U	0.083 U	0.096 U	0 092 U	0 10 U	0 096 U	0.47 B	0 10 B	0.097 U	0 10 B	0 093 U
Calcium	NA	NA	NA	257 B	10800	906 B	1760	2310	1050 B	474 B	930 B	1550	707 B	3470
Chromium	500	NA	NA	9.8	13.7	9.8	4 0	12 4	11 3	43.6	16.0	14 8	17 9	14 7
Cobalt	NA	NA	NA	6 3 B	5.5 B	6 7 B	4.5 B	3.9 B	13.2	3.7 B	6 4 B	7 5 B	3.3 B	7 8 B
Copper	600	600	NA	105	20 3	15 6	73 0	41 1	18.7	221	59 0	13 9	89 7	26.5
Iron	NA	NA	NA	42900	11800	17200	15800	13400	24100	40400	15900	17600	31800	15400
Lead	400	800	NA	174	280	8.0	84.3	345	8.8	254	212	8.4	302	31 7
Magnesium	NA	NA	NA	73 2 B	4410	3170	134 B	1390	3040	115 B	2940	3850	87 4 B	3180
Manganese	NA	NA	NA	264	481	249	814	55.4	185	157	135	147	91.4	334
Mercury	14	270	NA	0 18	15 9	0 020 U	0 09	3.1	0.020 U	0.24	1.3	0.02 B	0 23	0 88
Nickel	250	2,400	NA	11.8	41 5	14 0	4 3 B	13 4	16.8	21 8	20 1	17 1	14 9	17 1
Potassium	NA	NA	NA	301 U	674	732	287 B	712	619 B	349 U	1350	673	378 U	2560
Selenium	63	3 100	NA	2 9	0 99 U	1 2 U	1 7	1 7	1 2 U	2 6	1 1 U	1 2 U	2 9	1 1 U
Silver	110	4,100	NA	0.33 U	0 29 U	0 34 U	0 32 U	0.38 U	0 34 U	0.30 U	0.31 U	0.34 U	0.32 U	0 33 U
Sodium	NA	NA	NA	101 U	150 B	102 U	125 B	176 B	103 U	99.4 B	142 B	153 B	152 B	148 B
Thallium	2	2	NA	1 1 U	0 99 U	1 2 U	1 1 U	1 2 U	1.2 U	1.0 U	1 1 U	1 2 U	1 1 U	1 1 U
Vanadium	370	7,100	NA	12.0	14.1	14 0	8 9 B	17 2	15 6	22 0	21 8	19.0	13 8	18 6
Zinc	1,500	1,500	NA	43 2	88 0	41 4	368	179	51 9	144	156	43 4	40 0	47 4

Notes.

Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1 5-2
Dup3 Duplicate sample of SB12-12.5-13

Qualifiers

U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than or equal to the Instrument Detection Limit
N - The spiked sample recovery is not within control limits.
NR - Not analyzed
NA - Not available

Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria

Table 6

Summary Analytical Results of Inorganic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB4-23.5-24		SB5-1 5-2		SB5-10 5-11		SB5-23.5-24		SB6-2.5-3		SB6-12.5-13		SB6-23.5-24		SB7-1.5-2		SB7-19.5-20		SB7-27.5-28		SB8-1 5-2	
Lab Sample Number				34372		34529		34530		34531		34532		34533		34534		34539		34540		34541		34542	
Sampling Date				12/03/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97	
Matrix				SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Dilution Factor				NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Units				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
	New Jersey Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (mg/kg)																						
METALS																									
Aluminum	NA	NA	NA	7970		8520		7850		7340		7540		5790		8070		662		6880		5800		1050	
Antimony	14	340	NA	1 1	U	3 4		4 3		1 4	B	1 4	B	1.8	B	2.1	B	33.2		1 7	B	1 1	B	3 5	
Arsenic	20	20	NA	2 9		2.7		4 3		3.1		3.1		2.0		4.2		24 9		3 4		4.0		8.4	
Barium	700	47,000	NA	49 8	B	95.2		119		33.7	B	62 1		59.7		90.2		53 5		33.0	B	62 1		49.2	
Beryllium	1	1	NA	0 47	B	0.50		0.36	B	0 41	B	0 26	B	0.22	B	0.32	B	0 13	B	0 33	B	0 31	B	0.19	B
Cadmium	1	100	NA	0.100	U	0 30	B	0.14	U	0 15	U	0 14	U	0 14	U	0 18	B	0 13	U	0.14	U	0 15	U	0 14	U
Calcium	NA	NA	NA	1800		3320		10500		1350		503	B	10800		13000		157	B	1220		3820		489	B
Chromium	500	NA	NA	10 2		13.5		16.6		9 3		14 9		11 0		16.5		13 2		10.5		10 0		4 4	
Cobalt	NA	NA	NA	4 5	B	9 6	B	6 3	B	5.9	B	7.2	B	5.7	B	6.1	B	4 1	B	6 0	B	4 6	B	1 8	B
Copper	600	600	NA	13 7		73 5		36 4		13.3		18 2		27 4		25 2		88 1		14 7		25 5		36 0	
Iron	NA	NA	NA	13800		14200		18700		13700		13100		13100		13800		41800		14900		12200		14500	
Lead	400	800	NA	20.9		211		1020		17 2		39.0		56.0		142		509		35.3		201		88 4	
Magnesium	NA	NA	NA	2200		4420		3460		2060		2420		2450		3320		54 9	B	2450		2410		93 8	B
Manganese	NA	NA	NA	134		266		391		122		168		172		209		127		289		175		33.3	
Mercury	14	270	NA	0 09		0 92		1 1		0 04	B	0 05		0.13		0.27		0 21		0 03	B	0.51		0 10	
Nickel	250	2,400	NA	10 5		24.3		18.5		10 9		12 1		11 7		13 3		12 6		11 5		10 6		6 5	B
Potassium	NA	NA	NA	529	B	3580		2510		432	B	919	B	1380		1720		189	B	506	B	779	B	138	B
Selenium	63	3,100	NA	1 2	U	1.1	U	1 2	U	1 2	U	1 1	U	1 2	U	1 1	U	1 9		1 1	U	1 2	U	1 9	
Silver	110	4,100	NA	0.35	U	0.26	U	0 28	U	0.30	U	0 27	U	0 28	U	0.28	U	0.26	U	0.28	U	0.29	U	0.29	U
Sodium	NA	NA	NA	169	B	323	B	87 7	B	69 5	U	75.8	B	90.4	B	316	B	73.4	B	65 3	U	133	B	80 9	B
Thallium	2	2	NA	1 2	U	1.0	U	1 0	U	1 1	U	1 0	U	1 0	U	1 0	U	0 94	U	1 0	U	1 1	U	1 1	U
Vanadium	370	7,100	NA	12 6		20 5		22 2		11 0	B	16 6		15 0		16.5		16.6		12.0		13 3		10 1	B
Zinc	1,500	1,500	NA	44 9		379		135		59 0		49 3		56 0		178		31 3		44 0		98 2		160	

Notes:
Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1.5-2
Dup3 Duplicate sample of SB12-12.5-13

Qualifiers
U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than or equal to the Instrument Detection Limit.
N - The spiked sample recovery is not within control limits
NR - Not analyzed
NA - Not available

Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria

Table 6

Summary Analytical Results of Inorganic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB8 15 5-16		SB8-27.5-28		SB9-1.5-2		SB9-16-16 5		SB9-24-24 5		SB10-1 5-2		SB10 11-11 5		SB10-31 5-32		SB11-3-3.5		SB11-22-22.5		SB11-31-31 5	
Lab Sample Number				34543		34544		34545		34546		34547		34548		34549		34550		34693		34694		34695	
Sampling Date				12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/04/97		12/05/97		12/05/97		12/05/97	
Matrix				SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Dilution Factor				NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Units				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
	New Jersey Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (mg/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (mg/kg)																						
METALS																									
Aluminum	NA	NA	NA	7970		7000		1020		8730		3730		1360		6960		7480		7530		7650		7660	
Antimony	14	340	NA	2.0	B	1 5	B	3.8		2.2	B	2 4		2.0	B	2 1	B	1 6	B	5.0		2 5		2.0	B
Arsenic	20	20	NA	2.1		3 5		10.5		2 7		6.6		9.1		2 7		5.6		34 9		11 4		6.4	
Barium	700	47,000	NA	83 6		35 5	B	52 9		76.0		65 4		40.2	B	77.8		50 3		177		157		82.5	
Beryllium	1	1	NA	0.31	B	0.37	B	0 22	B	0 34	B	0 30	B	0 17	B	0 45	B	0 30	B	0 82		0 36	B	0 48	B
Cadmium	1	100	NA	0 13	U	0 14	U	0 14	U	0 12	U	0 14	U	0.15	U	0 14	U	0 14	U	1 1	B	0 15	U	0 15	U
Calcium	NA	NA	NA	6390		2510		220	B	8520		10900		2140		7780		1260		2080		5790		10200	
Chromium	500	NA	NA	15 7		9.3		5.4		17 7		9.7		4.5		18 8		12.8		17 5		35.8		15.3	
Cobalt	NA	NA	NA	7 7	B	5 9	B	1 9	B	8.5	B	4 1	B	2 1	B	9 2	B	4.3	B	9 2	B	8.9	B	6.5	B
Copper	600	600	NA	24 9		13 0		136		36.7		51 5		58 2		14 8		34 2		69.8		53.1		46 7	
Iron	NA	NA	NA	14200		13500		17300		16400		14800		10200		16100		15000		27400		17100		15800	
Lead	400	800	NA	212		23.1		113		78 2		205		255		9.7		254		569		3340		201	
Magnesium	NA	NA	NA	3440		2310		42 2	B	3760		1700		113	B	7910		2460		2760		2540		3560	
Manganese	NA	NA	NA	342		384		49.3		335		181		30.3		380		121		295		252		335	
Mercury	14	270	NA	0 46		0.03		0 13		0 37		0.38		0.09		0.06		0 55		0.62		2 6		1 8	
Nickel	250	2,400	NA	15 4		11.3		6.6	B	17 8		10 0		22 5		91 8		11 2		40.1		14 1		12 9	
Potassium	NA	NA	NA	2360		489	B	132	B	2360		576	B	167	B	2330		886	B	2330		752	B	1350	
Selenium	63	3,100	NA	1 1	U	1 1	U	1.2	U	1.0	U	1 1	U	1 2	U	1 2	U	1 2	U	1 2	B	1 2	U	1 2	U
Silver	110	4,100	NA	0.27	U	0.26	U	0 28	U	0.25	U	0 40	B	0 29	U	0 29	U	0 29	U	0.31	U	0.34	B	0 30	U
Sodium	NA	NA	NA	61 1	B	65.1	U	66 2	U	58 0	U	65 4	B	130	B	128	B	67 5	U	89.6	B	91.9	B	124	B
Thallium	2	2	NA	0.98	U	1.0	U	1 0	U	0 91	U	0.99	U	1 1	U	1 1	U	1 1	U	1 1	U	1 1	U	1 3	U
Vanadium	370	7,100	NA	22.2		11.2	B	9 9	B	21 3		11 6		10 9	B	19.6		15 4		24 8		18 7		23 8	
Zinc	1,500	1,500	NA	56 7		44 1		20 6		76 4		59 4		297		36 5		102		831		274		596	

Notes:

Dup Duplicate sample of SB2-15.5-16
Dup2 Duplicate sample of SB9-1.5-2
Dup3 Duplicate sample of SB12-12.5-13

Qualifiers

U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than or equal to the Instrument Detection Limit.
N - The spiked sample recovery is not within control limits.
NR - Not analyzed
NA - Not available

Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria

Table 6

Summary Analytical Results of Inorganic Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB12-1 5-2		SB12-12.5-13		SB12-31-31.5		Dup		Dup-2		Dup3	
Lab Sample Number				34689		34690		34691		34359		34538		34892	
Sampling Date				12/05/97		12/05/97		12/05/97		12/03/97		12/04/97		12/05/97	
Matrix				SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
Dilution Factor				NA		NA		NA		NA		NA		NA	
Units				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
	New Jersey Residential Direct Contact Soil Cleanup Criteria (mg/kg)	*New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (mg/kg)*	*New Jersey Impact to Ground Water Soil Cleanup Criteria (mg/kg)*												
METALS															
Aluminum	NA	NA	NA	1470		4290		4490		3880		1720		4800	
Antimony	14	*340*	NA	5.9		2.0	B	1.4	B	1.0	U	1.8	B	2.8	B
Arsenic	20	20	NA	11.1		6.9		5.0		11.3		10.5		11.3	
Barium	700	47,000	NA	35.5	B	167		93.8		200		87.7		202	
Beryllium	1	1	NA	0.16	B	0.26	B	0.26	B	0.29	B	0.34	B	0.19	B
Cadmium	1	100	NA	0.22	U	0.14	U	0.14	U	0.18	B	0.22	U	0.66	B
Calcium	NA	NA	NA	148	B	12500		15600		3030		600	B	11600	
Chromium	500	NA	NA	8.4		10.7		8.8		10.7		8.4		14.6	
Cobalt	NA	NA	NA	8.3	B	6.5	B	4.4	B	3.1	B	3.3	B	6.0	B
Copper	600	600	NA	251		84.4		71.9		37.1		155		83.4	
Iron	NA	NA	NA	28400		13600		13200		14900		15600		29800	
Lead	400	800	NA	328		420		152		558		59.5		593	
Magnesium	NA	NA	NA	54.0	B	2170		1000		1130	B	82.1	B	1660	
Manganese	NA	NA	NA	277		220		327		43.2		29.8		340	
Mercury	14	270	NA	0.18		1.9		0.54		3.0		0.07		1.1	
Nickel	250	2,400	NA	7.7	B	15.2		9.1	B	10.2		7.4	B	16.3	
Potassium	NA	NA	NA	144	B	540	B	773	B	448	B	189	B	678	B
Selenium	63	*3,100*	NA	1.8	U	1.1	U	1.2	U	1.7		1.8	U	1.6	U
Silver	110	4,100	NA	0.43	U	0.28	U	0.28	U	0.37	B	0.44	U	0.40	U
Sodium	NA	NA	NA	102	U	161	B	119	B	151	B	104	U	133	B
Thallium	2	2	NA	1.6	U	1.0	U	1.0	U	1.1	U	1.6	U	1.5	U
Vanadium	370	7,100	NA	7.8	B	12.7		15.6		13.7		13.4	B	14.2	B
Zinc	1,500	1,500	NA	17.1		494		129		168		14.3		972	

Notes

Dup Duplicate sample of SB2-15 5-16
Dup2 Duplicate sample of SB9-1.5-2
Dup3 Duplicate sample of SB12-12.5-13

Qualifiers

U - The compound was not detected at the indicated concentration
B - Reported value is less than the Method Detection Limit but greater than or equal to the Instrument Detection Limit.
N - The spiked sample recovery is not within control limits
NR - Not analyzed
NA - Not available

Concentration exceeds NJDEP Residential Direct Contact Soil Cleanup Criteria

TABLE 7

Summary Analytical Results of Wet Chemistry Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB1-1 5-2	SB1-11 5-12	SB1-19 5-20	SB2-1 5-2	SB2-15.5-16	SB2-19 5-20	SB3-1 5-2.0	SB3-10-10.5	SB3-19.5-20	SB4-1 5-2 0	SB4-14.5-15	SB4 23 5-24
Lab Sample Number				34360	34361	34362	34363	34365	34364	34366	34367	34368	34370	34371	34372
Sampling Date				12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97	12/03/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				1.0	1 0	1.0	1.0	1.0	1.0	1 0	1.0	1 0	1.0	1 0	1 0
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)												
WET CHEMISTRY															
Chromium VI	10	NA	NA	2 0 U	2.0 U	2.0 U	2.0 U	2.7	2 0 U	8.1	2.0 U	2 0 U	2.0 U	2.0 U	2 0 U
Total Cyanide	1,100,000	21,000,000	NA	0 5 U	0 5 U	0.5 U	0 85	0.5 U	0 5 U	0.5 U	0 5 U	0 5 U	0 5 U	0.5 U	0 5 U
Total Petroleum Hydrocarbons	10,000	10,000	10,000*	43 3	36 6	56 9	25 0 U	25 0 U	25 0 U	1210	25 0 U	25 0 U	67 8	25 0 U	25 0 U

U - The compound was not detected at the indicated concentration.
NR - Not analyzed.
NA - Not available.
Dup. Duplicate sample of SB2-15 5-16
Dup. 2 Duplicate sample of SB9-1.5-2
Dup. 3 Duplicate sample of SB12-12.5-13.
* NJDEP Total Organic Contaminant Criteria.

TABLE 7

Summary Analytical Results of Wet Chemistry Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth			SB5-1 5-2	SB5-10 5-11	SB5-23.5-24	SB6-2 5-3	SB6-12.5-13	SB6-23 5-24	SB7-1.5-2	SB7-19.5-20	SB7-27 5-28	SB8-1 5-2	SB8-15 5-16	SB8 27.5-28
Lab Sample Number			34529	34530	34531	34532	34533	34534	34539	34540	34541	34542	34543	34544
Sampling Date			12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97
Matrix			SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)											
WET CHEMISTRY														
Chromium VI	10	NA	NA	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.4	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total Cyanide	1,100,000	21,000,000	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Petroleum Hydrocarbons	10,000	10,000	10,000*	39.8	66.6	25.0 U	25.0 U	69.9	427	310	25.0 U	25.0 U	52.6	94.8	25.0 U

U - The compound was not detected at the indicated concentration.
NR - Not analyzed.
NA - Not available.
Dup Duplicate sample of SB2-15.5-16.
Dup. 2 Duplicate sample of SB9-1.5-2
Dup 3 Duplicate sample of SB12-12.5-13.
* NJDEP Total Organic Contaminant Criteria.

TABLE 7

Summary Analytical Results of Wet Chemistry Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth				SB9-1 5-2	SB9-16-16.5	SB9-24-24.5	SB10-1 5-2	SB10-11-11 5	SB10-31.5-32	SB11 3-3.5	SB11-22-22.5	SB11-31-31 5	SB12-1 5-2	SB12-12 5-13	SB12-31-31 5
Lab Sample Number				34545	34546	34547	34548	34549	34550	34693	34694	34695	34689	34690	34691
Sampling Date				12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/04/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97	12/05/97
Matrix				SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Dilution Factor				1.0	1.0	1.0	1 0	1.0	1 0	1.0	1.0	1 0	1 0	1 0	1.0
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)												
WET CHEMISTRY															
Chromium VI	10	NA	NA	2.0 U	2 0 U	2 0 U	2 0 U	2 0 U	2 0 U	2 0 U	2.0 U	2.0 U	2 0 U	2 0 U	2 0 U
Total Cyanide	1,100,000	21,000,000	NA	0 5 U	0.5 U	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U	0 5 U	0.6	0 71	0 98	0 5 U
Total Petroleum Hydrocarbons	10,000	10,000	10,000*	52 7	33 4	0 0 U	27 8	25.0 U	25.0 U	NR	NR	NR	NR	NR	NR

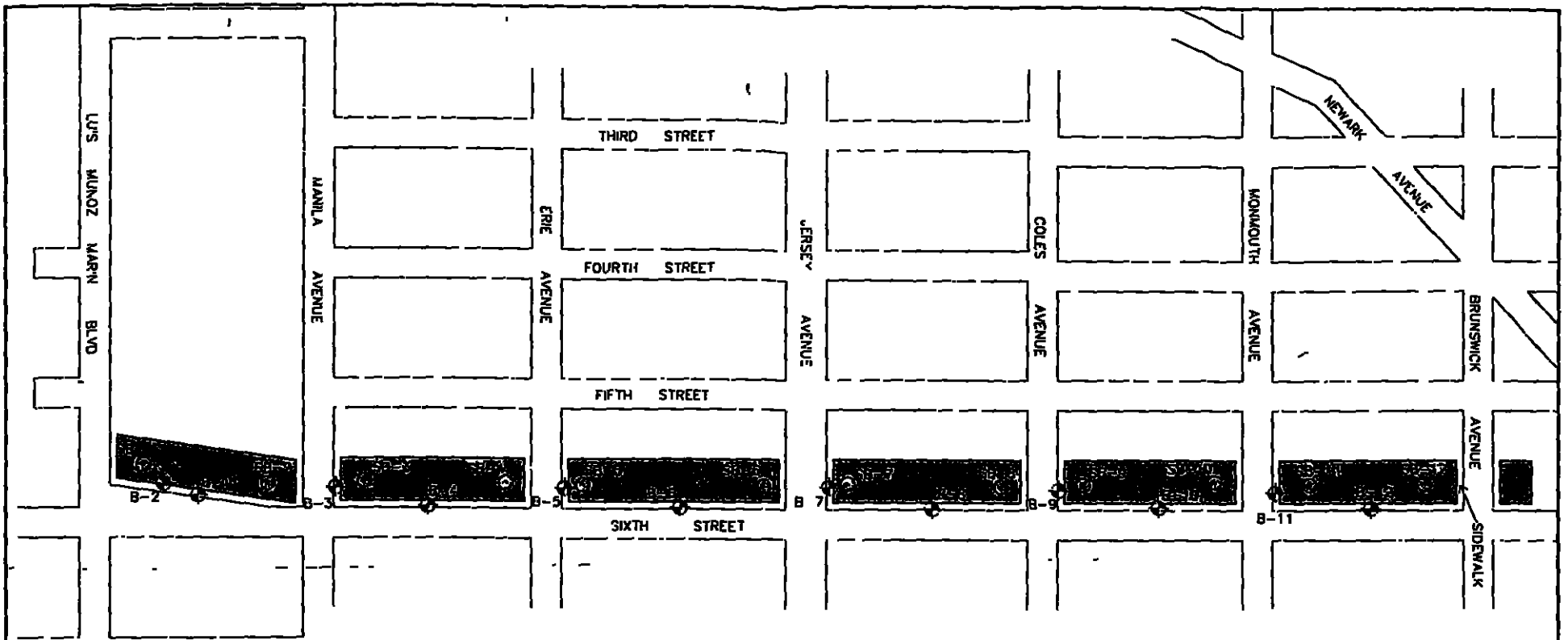
U - The compound was not detected at the indicated concentration.
NR - Not analyzed.
NA- Not available.
Dup. Duplicate sample of SB2-16.5-18.
Dup. 2 Duplicate sample of SB9-1 5-2.
Dup. 3 Duplicate sample of SB12-12.5-13.
* NJDEP Total Organic Contaminant Criteria

TABLE 7

Summary Analytical Results of Wet Chemistry Compounds for Soil Samples Collected
Sixth Street Embankment Project
Jersey City, New Jersey

Sample ID / Sample Depth Lab Sample Number Sampling Date Matrix Dilution Factor Units				Dup. 34369 12/03/97 SOLID 1.0 mg/kg	Dup-2 34538 12/04/97 SOLID 1.0 mg/kg	DUP3 34892 12/05/97 SOLID 1.0 mg/kg
	New Jersey Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (ug/kg)	New Jersey Impact to Ground Water Soil Cleanup Criteria (ug/kg)			
WET CHEMISTRY						
Chromium VI	10	NA	NA	2.0 U	2.0 U	2.0 U
Total Cyanide	1,100,000	21,000,000	NA	0.5 U	0.5 U	8.1
Total Petroleum Hydrocarbons	10,000	10,000	10,000*	36.5	42.9	NR

U - The compound was not detected at the indicated concentration.
NR - Not analyzed.
NA- Not available.
Dup Duplicate sample of SB2-15.5-16.
Dup. 2 Duplicate sample of SB9-1 5-2
Dup. 3 Duplicate sample of SB12-12 5-13
* NJDEP Total Organic Contaminant Criteria.



LEGEND

- B-12 GEOTECHNICAL SOIL BORING LOCATION
- SB-12 ENVIRONMENTAL SOIL BORING LOCATION
- AREA OF FORMER CONRAIL RAILROAD EMBANKMENT

NOTE

- B-1* BORING DELETED FROM THE GEOTECHNICAL DRILLING PROGRAM DUE TO UNDERGROUND UTILITY LOCATION CONFLICT

N

GRAPHIC SCALE
200 100 0 200
(IN FEET)
1 inch = 200 feet

JCRA – 61h STREET

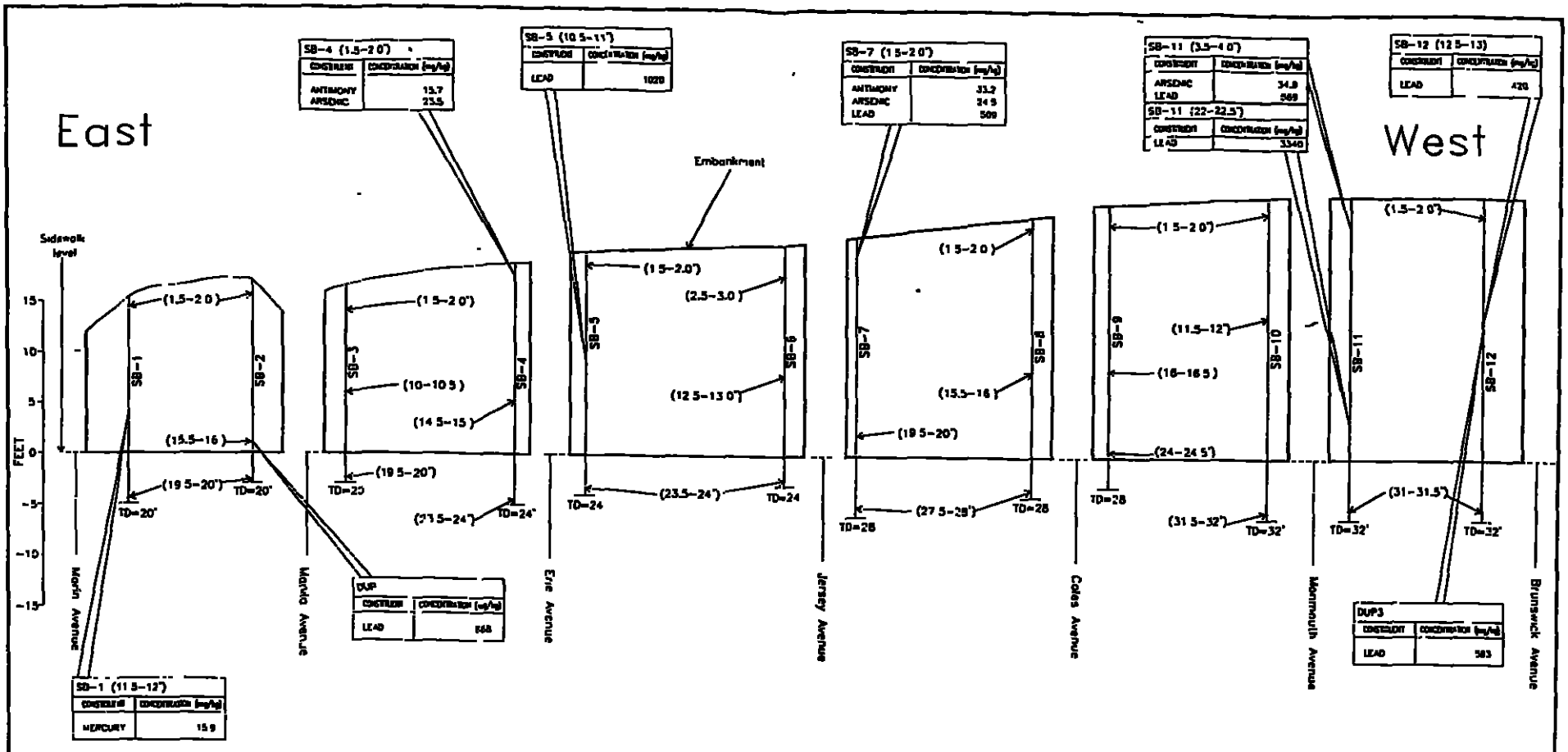
JERSEY CITY, NEW JERSEY

SOIL BORING LOCATION MAP

DRESDNER ROBIN
ENVIRONMENTAL MANAGEMENT, INC

1-21-98
1" = 200'

2



Legend

DUP	Duplicate Sample of SB2 (15-16')
DUP3	Duplicate Sample of SB12 (12.5-13')
TD	Total Depth
SB-12	Approximate Soil Boring Location
(1.5-2.0')	Environmental Soil Sample Interval (Feet Below Top of Embankment)

Scale

Horizontal 1 inch = 200 feet

Vertical 1 inch = 10 feet

JCRA - 6th Street

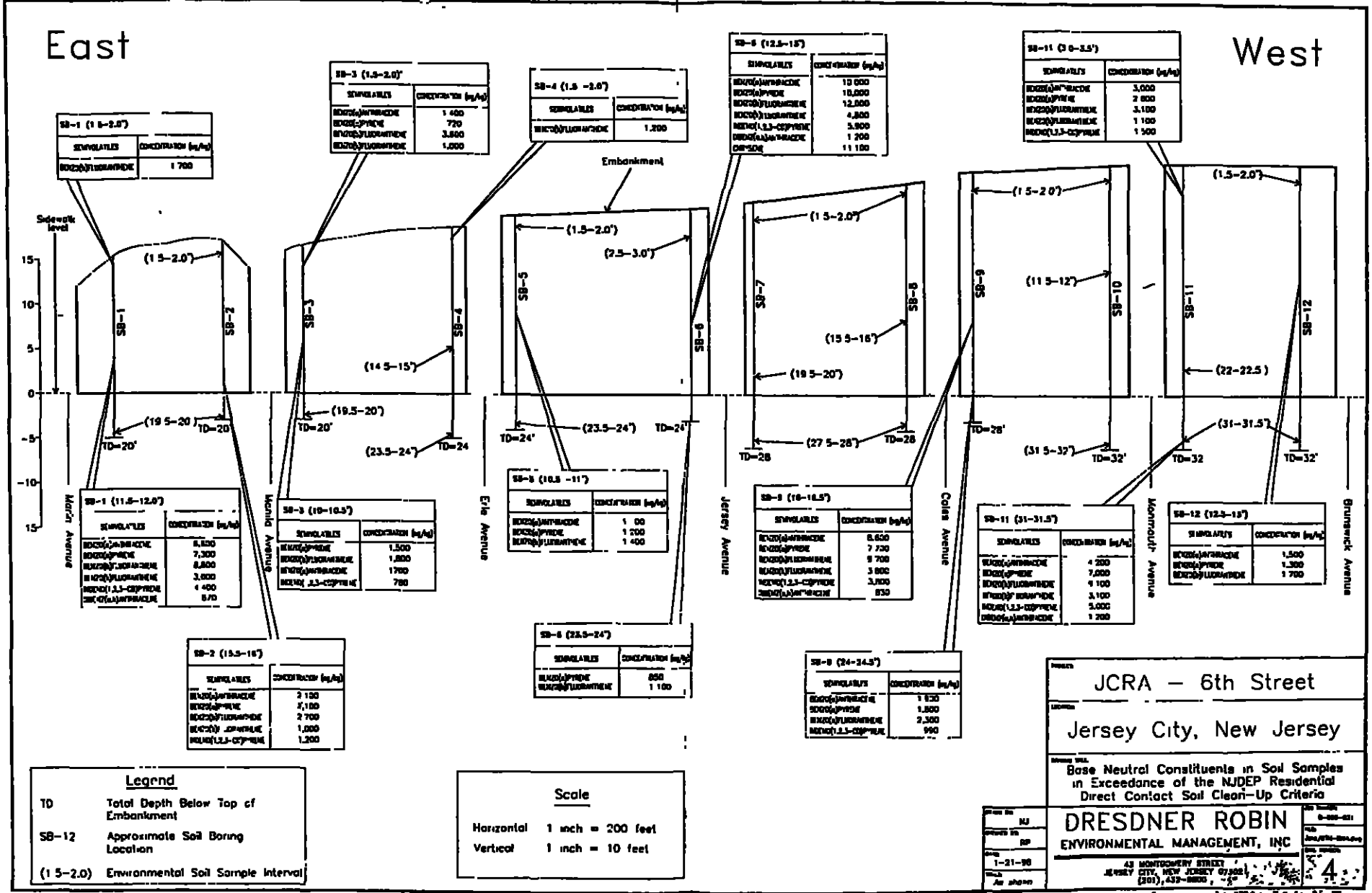
Jersey City, New Jersey

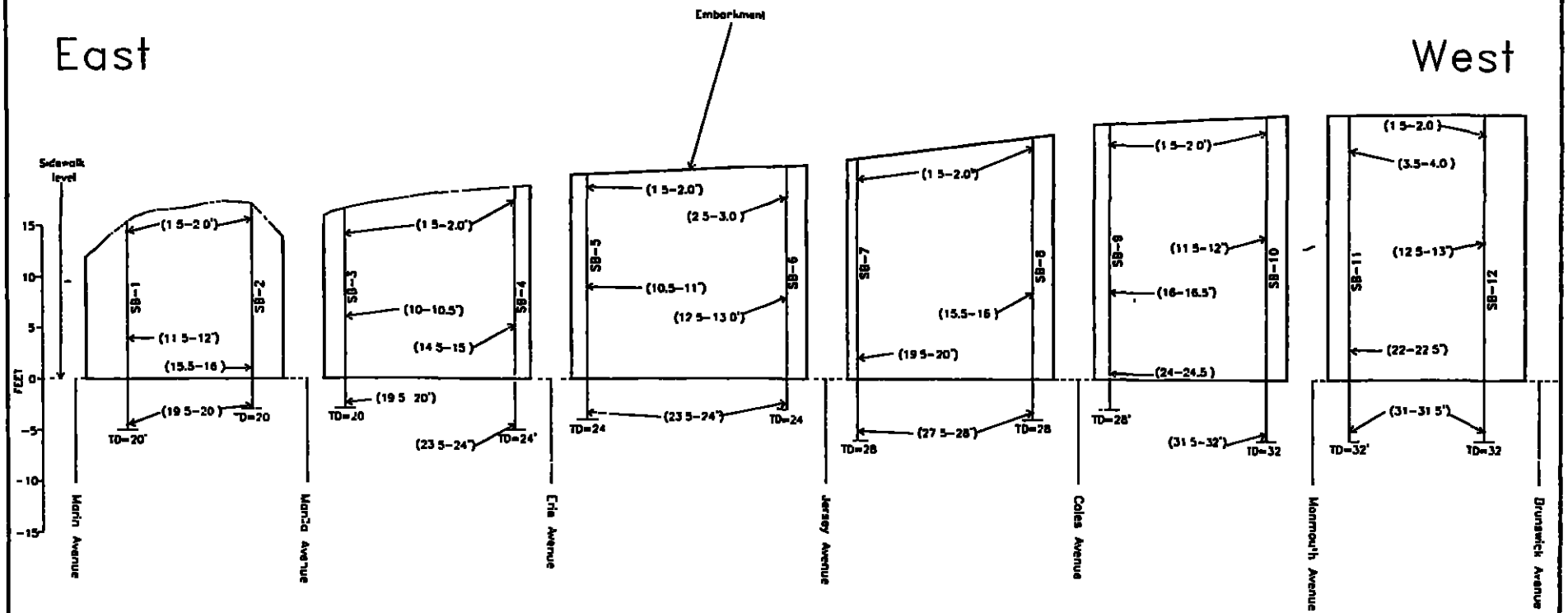
Inorganic Constituents in Soil Samples in Exceedance of the NJDEP Residential Direct Contact Soil Clean-Up Criteria

drawn by	NJ
checked by	RP
date	1-21-98
scale	As shown
job number	9-050-331
file	
drawing number	5

DRESDNER ROBIN
ENVIRONMENTAL MANAGEMENT, INC

43 MONTGOMERY STREET
JERSEY CITY NEW JERSEY 07302
(201) 432-9800


East
West
Embankment
Sidewalk level
15
10
5
0
-5
-10
15
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7
SB-8
SB-9
SB-10
SB-11
SB-12
(1.5-2.0')
(14.5-15')
(19.5-20')
TD=20'
(23.5-24')
TD=24'
(2.5-3.0')
(15.5-16')
(19.5-20')
(27.5-28')
TD=28'
(11.5-12')
(31.5-32')
TD=32'
(22-22.5')
(31-31.5')
Marin Avenue
Manila Avenue
Erie Avenue
Jersey Avenue
Coles Avenue
Monmouth Avenue
Brunswick Avenue
SB-1 (1.5-2.0')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(b)FLUORANTHENE | 1 700
SB-3 (1.5-2.0')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 1 400
BENZO(a)PYRENE | 720
BENZO(b)FLUORANTHENE | 3,600
BENZO(k)FLUORANTHENE | 1,000
SB-4 (1.5 -2.0')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(b)FLUORANTHENE | 1,200
SB-6 (12.5-15')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 13 000
BENZO(a)PYRENE | 10,000
BENZO(b)FLUORANTHENE | 12,000
BENZO(k)FLUORANTHENE | 4,800
INDENO(1,2,3-CD)PYRENE | 5,900
DIBENZ(a,h)ANTHRACENE | 1 200
CHRYSENE | 11 100
SB-11 (30-35')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 3,000
BENZO(a)PYRENE | 2 800
BENZO(b)FLUORANTHENE | 3,100
BENZO(k)FLUORANTHENE | 1 100
INDENO(1,2,3-CD)PYRENE | 1 500
SB-1 (11.5-12.0')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 6,600
BENZO(a)PYRENE | 7,300
BENZO(b)FLUORANTHENE | 8,800
BENZO(k)FLUORANTHENE | 3,600
INDENO(1,2,3-CD)PYRENE | 4 400
DIBENZ(a,h)ANTHRACENE | 870
SB-3 (10-10.5')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)PYRENE | 1,500
BENZO(b)FLUORANTHENE | 1,800
BENZO(a)ANTHRACENE | 1700
INDENO(1,2,3-CD)PYRENE | 780
SB-5 (10.5 -11')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 1 00
BENZO(a)PYRENE | 1 200
BENZO(b)FLUORANTHENE | 1 400
SB-8 (10-10.5')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 8,600
BENZO(a)PYRENE | 7 700
BENZO(b)FLUORANTHENE | 9 700
BENZO(k)FLUORANTHENE | 3 800
INDENO(1,2,3-CD)PYRENE | 3,000
DIBENZ(a,h)ANTHRACENE | 830
SB-11 (31-31.5')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 4 200
BENZO(a)PYRENE | 7,000
BENZO(b)FLUORANTHENE | 9 100
BENZO(k)FLUORANTHENE | 3,100
INDENO(1,2,3-CD)PYRENE | 5,000
DIBENZ(a,h)ANTHRACENE | 1 200
SB-12 (12.5-15')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 1,500
BENZO(a)PYRENE | 1,300
BENZO(b)FLUORANTHENE | 1 700
SB-2 (15.5-16')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 2 100
BENZO(a)PYRENE | 2,100
BENZO(b)FLUORANTHENE | 2 700
BENZO(k)FLUORANTHENE | 1,000
INDENO(1,2,3-CD)PYRENE | 1,200
SB-6 (23.5-24')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)PYRENE | 850
BENZO(b)FLUORANTHENE | 1 100
SB-8 (24-24.5')
SEMIVOLATILES | CONCENTRATION (ug/kg)
BENZO(a)ANTHRACENE | 1 850
BENZO(a)PYRENE | 1,800
BENZO(b)FLUORANTHENE | 2,300
INDENO(1,2,3-CD)PYRENE | 990
Legend
TD Total Depth Below Top of Embankment
SB-12 Approximate Soil Boring Location
(1.5-2.0) Environmental Soil Sample Interval
Scale
Horizontal 1 inch = 200 feet
Vertical 1 inch = 10 feet
PROJECT
JCRA - 6th Street
LOCATION
Jersey City, New Jersey
DRAWING TITLE
Base Neutral Constituents in Soil Samples in Exceedance of the NJDEP Residential Direct Contact Soil Clean-Up Criteria
DRAWN BY NJ
CHECKED BY RP
DATE 1-21-98
SCALE As shown
DRESDNER ROBIN
ENVIRONMENTAL MANAGEMENT, INC
43 MONTGOMERY STREET
JERSEY CITY, NEW JERSEY 07302
(201) 432-8800
JOB NUMBER 0-000-021
FILE
DWG NUMBER 4



Legend

TD	Total Depth
SB-12	Approximate Soil Boring Location
(1 5-2 0)	Environmental Soil Sample Interval (Feet Below Top of Embankment)

Scale

Horizontal	1 inch = 200 feet
Vertical	1 inch = 10 feet

JCRA – 6th Street

Jersey City, New Jersey

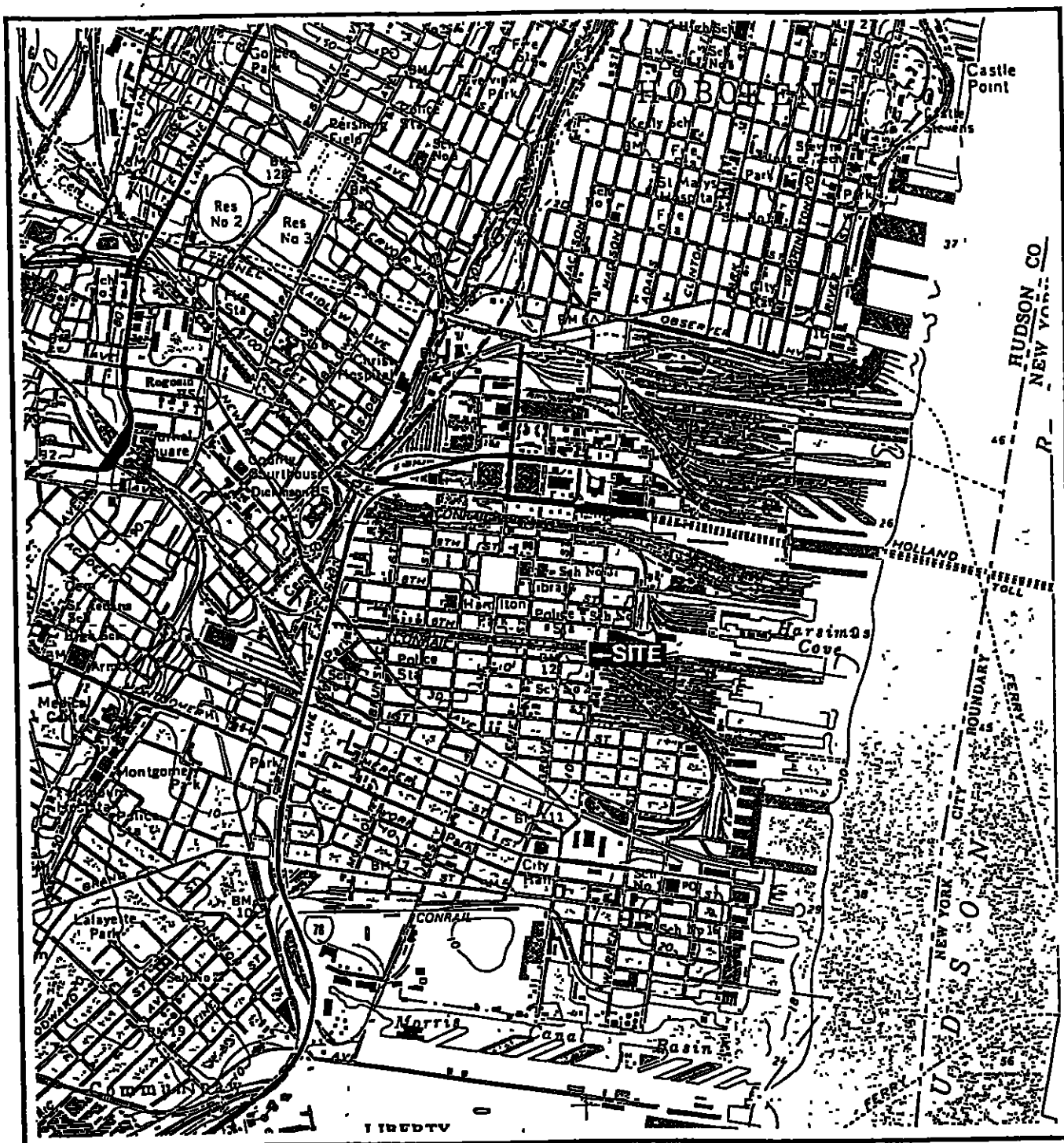
Embankment Cross-Section

DRESDNER ROBIN
ENVIRONMENTAL MANAGEMENT, INC

43 MONTGOMERY STREET
JERSEY CITY, NEW JERSEY 07302
(201) 432-9800

1-21-93

3



Scale 1:24000 N40°43.490' W74°02.455' Contour Interval 10 feet

S. P. C.: N689609.21901 E2173445.14439

DRESDNER ROBIN ENVIRONMENTAL MANAGEMENT, INC.

REGIONAL LOCATION
Sixth Street Embankments
Jersey City, N.J.

Source: USGS 7.5 Min. Series
Jersey City, NJ-NY
Quadrangle (1967)

N

FIGURE
1

APPENDIX 6

Laboratory Quality Assurance Project Plan

ENVIROTECH RESEARCH, INC.

777 New Durham Road
Edison, New Jersey 08817
Tel (908) 549-3900
Fax (908) 549-3679

(PORTIONS OF QAPP)

QUALITY ASSURANCE MANUAL

ENVIROTECH RESEARCH, INC.

February 1995

ENVIROTECH RESEARCH SOP No. S101.1
STANDARD OPERATING PROCEDURE
FOR SAMPLE CONTAINER PREPARATION AND SHIPMENT

doc: S101
Revision:

1. SCOPE and APPLICATION

1.1. The procedures outlined below are to be followed for preparing sample shipment containers.

1.2. Included in this procedure are the requirements for producing Field Blanks and Trip Blanks.

1.3. The procedure is applicable for commercial clients and government contracts for containers being picked up or shipped via an overnight courier.

2. APPARATUS

2 1. Level II precleaned Sample bottles

2.2. Sample coolers

2.3. Ice bags

2.4. Preservation Reagents

2.5. Chain of Custody Documents, Custody Seals, Sample container labels, Hazardous contents labels

3. PROCEDURES

3.1. A request for bottle order form, Attachment 1 is initiated by marketing. It specifies the client, anticipated date of sampling, number of samples to be taken by matrix, the required methodology and any required QA/QC including Field and Trip Blanks or other project specific requirements.

3.2. The Sample Custody Officer or his assistant will prepare the bottle order either the day before or the day of anticipated sampling. Attachment 2, taken from the NJDEPE "Field Sampling Procedures Manual, May 1992" is referenced to determine the proper bottle type and preseverative for the methodology requested. A chart that describes containers for Task Trip and Field blanks is given in Attachment 3. Footnotes from Attachment 2 also apply to Attachment 3.

3.3. The Sample Custody Officer or his assistant retrieves the appropriate glassware from the stock room. The bottles with the oldest date of receipt tag on them are always used first. The number of bottles required, taking into account the project QA/QC requirements are taken and staged on the bottle preparation bench and the appropriate preservative is added in accordance with Attachment 2.

3.4. A Hazardous contents label is affixed to each bottle spiked with a preservative that identifies the preservative and its CAS number. Additionally, the top of the bottle is marked with the preservative and the analytical parameter the bottle is to receive.

3.5. A bottle is filled with water and marked "Temperature Monitor Bottle". It accompanies the sample bottles and is used to record the temperature of the incoming samples in accordance with Envirotech Research SOP No. S103.

3.6. PREPARATION OF FIELD and TRIP BLANKS.

3.6.1. For projects which require a field blank, the Sample Custody Officer or his assistant determines the required parameters from the request for bottle order form and prepares the bottles as if the field blank were an aqueous environmental sample as outlined above.

3.6.2. Additionally, another identical set of bottles are retrieved and not preserved. These bottles are filled with the analyte free laboratory water used for method blanks. They are not preserved. The bottles are labeled with the preprinted label that identifies the bottle's use as water for creation of the field blank. The analytical parameter is filled in on the label and the date the lab water added is written on the label.

3 6.3. For projects which require a Trip Blank, the Sample Custody Officer or his assistant will preserve two 40 ml VOA vials with four drops of concentrated HCl and fill with analyte free water. A Hazardous contents label is affixed to each vial. Care must be taken to eliminate any air bubbles when filling and sealing the vials. An Envirotech Research sample label is filled out, noting the date and time prepared and the preparers signature.

3.6.4. The Field and Trip Blanks accompany the environmental sampling bottles to the site and back to the laboratory.

3.7. All the required bottleware, including the blanks and the Temperature Monitor Bottle are placed in a sufficient number of coolers. Do not stack bottles on top of each other.

3 8. For each cooler packed, two or more bags of ice are placed on top of the sample containers. After sampling, the ice is removed from the bags and poured over the samples.

3.9. Use one custody seal for each cooler. Record the number on the Chain of Custody document.

3.10. SAMPLE CONTAINER DELIVERY

3.10.1. For containers being picked up by the samplers, sign the custody over to them upon their arrival to the laboratory after going over the contents with them in accordance with ETR SOP No. S100. Proceed to step 3.11.

3.10.2. For containers being shipped by overnight courier, proceed with steps 3.11 and 3.12. Then fill out an air bill for each cooler and have it picked up by the overnight carrier. Retain the shipping receipt to document its delivery. This information will be included with the sampling documents when the samples are returned to the laboratory.

3.11. Place sample Chain of Custody documents, extra cooler custody seals and sample labels in a zip lock bag and tape it to the inside cover of the cooler.

3.12. Seal each cooler with a Custody Seal.

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ATTACHMENT 1

Laboratory Service Request Form

Client. _____
Project Name _____
Project Manager. _____
Address: _____
_____
Phone/Fax: _____

Date Of Request: _____

Deliverables Required. ☐ Reduced
☐ Full
☐ Other: _____

Turnaround Request:
- ☐ Standard (3-4 weeks)
- ☐ 2 Week Rush (Surcharge Approved)
- ☐ 1 Week Rush (Surcharge Approved)
- ☐ 24 Hour (PHC's only) (Surcharge Approved)
- ☐ Other: _____

Type of Testing Program:
- ☐ NJPDES (600 Series/40CFR136)
- ☐ SW-846
- ☐ CLP
- ☐ RCRA Waste Classification
- ☐ Drinking Water (500 Series)
- ☐ Other: _____

Sampling Containers Required

# of Samples	Matrix	Parameters Requested

☐ Field Blanks: _____ ☐ Trip Blanks: _____

Special Instructions: _____
_____

☐ Container Pick-up at Laboratory, or ☐ Delivery
Date/Time: _____
Location: _____
_____
_____
_____

☐ Sample Delivery to Laboratory, or ☐ Pickup
Date/Time. _____
Location: _____
_____
_____
_____

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contract Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Volatile Organics	Aqueous-G, black phenolic plastic screw cap, teflon-lined septum	Aqueous - 40 ml	Cool, 4 deg C, dark, 0.08% $Na_2S_2O_3$ if residual Cl_2	10 days	USEPA-CLP Statement of Work for Organic Analysis, Multi Media, Multi Concentration (Doc.#OLM01.8)	(3) 5/90
	Nonaqueous-G, polypropylene cap, white teflon liner	Nonaqueous 120 ml		10 days		
Base Neutral/Acid Extractable (Semivolatile) Organics	Amber G, Teflon lined cap	1000 ml	Cool, 4 deg C, dark	Extraction Aqueous continuous liquid-liquid extraction must be started within 5 days Non-aqueous - 10 days Analysis - 40 days from VTSR*	As Above	(3)
Pesticide/ PCB's	As Above	As Above	As Above	As Above	As Above	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contract Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
High Level Volatile Organic Waste Samples	Aqueous-G, black phenolic plastic screw cap, teflon-lined septum Nonaqueous-G polypropylene cap, white teflon liner	Aqueous - 40 ml Nonaqueous 120 ml	Cool, 4 deg C, dark,	Analysis completed within 40 days of VTSR As Above	USEPA-CLP Statement of Work for Organic Analysis-Multi Media, High Concentration 9/88	(3)
High Concentration Extractable Organic Waste Samples	As Above	1000 ml	Cool, 4 deg C, dark	As Above	As Above	(3)
High Concentration Aroclors and Toxaphene samples	As Above	As Above	As Above	As Above	As Above	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contract Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Polychloriniated Dibenzo-p-Dioxins (PCDDs) and Dibenzofurans (PCDFs)	As Above	2000 ml 1 pint	As Above	None	USEPA-CLP Statement of Work for Analysis of Polychlorinated Dibenzo-p-Dioxins (PCDD) Polychlorinated Dibenzofurans (PCDF) Multi-Medi, Multi-Concentration (DFLM01.1) 9/91	(3)
Low Level Metals Water except Hg	Aqueous -P bottle, P cap, P liner	Aqueous - 1000 ml	Aqueous - HNO_3 to PH<2	180 days	USEPA-CLP Statement of Work for Low Concentration Water for Inorganic Analysis 8/90 (Doc.#ILC01.0)	(3)
Hg	As Above	As Above	As Above	26 days	As Above	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contract Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Cyanide, total amenable to chlorination	As Above	As Above	Aqueous - 0.6g ascorbic acid if residual Cl_2, NaOH to pH>12, cool, 4 deg C until analyzed, $CaCO_3$ in presence of sulfide	12 days	As Above	(3)
Total Nitrogen	As Above	As Above	H_2SO_4 to pH<2	12 days	As Above	(3)
Fluoride	As Above	As Above	4 deg C until analysis	26 days	As Above	(3)
Metals except Hg	Aqueous - P bottle, P cap, P liner	Aqueous - 1000 ml	Aqueous - HNO_3 to pH<2	180 days	USEPA-CLP Statement of Work for Inorganic Analysis Multi Media, Multi Concentration (Doc.#ILM02.0)	(3)
	Nonaqueous - Flint Glass bottle, black phenolic cap, polyethylene liner	Nonaqueous 4,8,16, or 32 oz	Nonaqueous - 4 deg C until analysis	As Above		
Hg	As Above	As Above	As Above	26 days	As Above	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contfact Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Cyanide	As Above	As Above	Aqueous - 0.6g ascorbic acid if residual Cl_2, NaOH to pH>12, cool, 4 deg C until analyzed $CaCO_3$ in presence of sulfide Nonaqueous Cool, 4 deg C until analyzed	12 days	As Above	(3)
High Level Metals except Hg	Aqueous - P bottle, P cap, P liner Nonaqueous - Flint Glass bottle, black phenolic cap, polyethylene liner	Aqueous - 1000 ml Nonaqueous 4,8,16, or 32 oz	Aqueous - HNO_3 to pH<2 Nonaqueous - 4 deg C until analysis	180 days As Above	USEPA-CLP Statement of Work for High Concentration Inorganic Analysis (Doc.#HCIN) 10/90	(3)
Hg	As Above	As Above	As Above	26 days	As Above	(3)
Low Level Volatile Organics	Aqueous-G,black phenolic plastic screw cap teflon-lined septum	Aqueous - 40 ml	Cool, 4 deg C, dark, 0.008% $Na_2S_2O_3$	7 days	USEPA-CLP Statement of Work for Low Concentration Water for Volatile Organics (Doc.#OLV01.0) 9/90	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of TARGET COMPOUND LIST/TARGET ANALYTE LIST
Using USEPA-Contract Lab Program Methodologies for Aqueous and Nonaqueous Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Cyanide	As Above	As Above	Aqueous - 0.6g ascorbic acid if residual Cl_2, NaOH to pH>12, cool, 4 deg C until analyzed, $CaCO_3$ in presence of sulfide Nonaqueous Cool, 4 deg C until analyzed	12 days	As Above	(3)
Low Level Semi-volatile Organics	Amber G, Teflon Lined Cap	1000 ml	Cool, 4 deg C, dark	Extraction - Continuous extraction must be started within 5 days ... Analysis - 40 days from start of extraction	USEPA-CLP Statement of Work for Low Concentration Water for Organic Analysis (Doc.#OLC01.0) 9/90	(3)
Low Level Pesticides/ PCBs Organics	Amber G, Teflon Lined Cap	1000 ml	Cool, 4 deg C, dark	As Above	As Above	(3)

* Validated time of sample receipt (at the laboratory)

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Volatile Organics - Concentrated Waste Samples	G, wide mouth, teflon liner	8 oz	None	14 days	SW-846, 3rd edition, Vol 1-B; GC-8010, 8015,8020; GC/MS-8240	(5)
Volatile Organics - Liquid Samples no residual Cl_2	G vial, teflon lined septum cap	40 ml	4 drops conc. HCl, cool, 4 deg C	As Above	As Above	(5)
Volatile Organics - Liquid Samples residual Cl_2	As Above	As Above	Collect sample in 4 oz Soil VOA container prepreserved w/10% $Na_2S_2O_3$. Gently mix sample and transfer to 40 ml VOA vial prepreserved w/4 drops conc. HCl, cool, 4 deg C	As Above	As Above	(5)
Volatile Organics - Liquid Samples for Acrolein and Acrylonitrile	As Above	As Above	Adjust to pH 4-5, cool, 4 deg C	As Above	SW-846, 3rd edition, Vol 1-B; GC-8030; GC/MS-8240	(5)

*Holding time begins at time of sample collection.

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES
for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Volatile Organics - Soil/Sediments Sludge	G, wide mouth, teflon liner	4 oz	Cool 4 deg C	As Above	SW-846, 3rd edition, Vol 1-B; GC-8010, 8015,8020; GC/MS-8240, 8260	(5)
Sulfates	P, G	100 ml (12)	Cool,4 deg C	28 days	SW-846, 3rd edition, Vol 1-C; 9035,9036, 9038	(6)
Total Organic Carbon	G-Preferred P-If determined that there is no contributing organic contamination	100 ml (12)	Cool, 4 deg C, dark, HCl or H_2SO_4 to pH<2 if analysis can't be done within 2 hrs	2 Hrs - unpreserved 28 days - preserved	SW-846, 3rd edition, Vol 1-C; 9060	(6)
Phenols	G only	1 liter (12)	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	SW-846, 3rd edition, Vol 1-C; 9065,9066, 9067	(6)
Total recoverable oil and grease	G only, wide mouth	1 liter	Cool, 4 deg C 5 ml HCl, Cool 4 deg C	Unpreserved- Few hrs Preserved - 28 days	SW-846, 3rd edition, Vol 1-C; 9070	(7)

*Holding time begins at time of sample collection.

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Oil and grease for sludge	G	1 liter (12)	Cool, 4 deg C pH<2 HCl	28 days	SW-846, 3rd edition, Vol 1-C; 9071	(7) No plastic tubing
Total Petroleum Hydrocarbons	G	1 liter 4 oz	Cool, 4 deg C	Aqueous 7 days Non-Aqueous 28 days Gasoline in soil 7 days	Method 418.1 (modified for soil)	(7)
Total Coliform	P, G	1 liter (12)	Cool, 4 deg C, $Na_2S_2O_3$ if residual Cl_2, EDTA if high in heavy metals	6 hrs	SW-846 3rd edition, Vol 1-C; 9131, 9132	(8)
Nitrate	P, G	1 liter (12)	Cool, 4 deg C, --- H_2SO_4 to pH<2, (2 ml/L)	24 hrs - Unpreserved --- 28 days - preserved	SW-846, 3rd edition, Vol 1-C; 9200	(6)
Chloride	P, G	1 liter (12)	Cool, 4 deg C	28 days	SW-846, 3rd edition, Vol 1-C; 9250, 9251, 9252	(6)

*Holding time begins at time of sample collection.

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Radium 228	P	1 liter (12)	Cool, 4 deg C preserve at lab with HNO_3 to pH<2, hold for minimum of 16 hrs before analysis, 6 mos.	Transport to lab within 5 days,	SW-846, 3rd edition, Vol 1-C; 9320	(6)
			HNO_3 to pH<2, suggested at sampling	6 mos		
Extractable Organics - Concentrated Waste Samples	G, wide mouth w/teflon liner	8 oz	Cool, 4 deg C	14 days	SW-846, 3rd edition, Vol 1-B; GC-8080; GC/MS-8270	(5)
Extractable Organics - Liquid Samples no residual Cl_2	G, amber, w/teflon liner	1 gallon or 2 1/2 gallon	Cool, 4 deg C	Extraction 7 days Analysis - 40 days from extraction	As Above	(5)

*Holding time begins at time of sample collection.

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Extractable Organics- Liquid Samples residual Cl_2	G, amber, w/Teflon liner	1 gallon or 2 1/2 gallon	3 ml 10% $Na_2S_2O_3$ per gallon, cool 4 deg C	Extraction 7 days --- Analysis - 40 days from extraction	As Above	(5)
Extractable Organics - Soils/Sediments Sludges	G, wide mouth, w/Teflon liner	8 oz	Cool 4 deg C	14 days	As Above	(5)
Metals except Cr VI and Hg	P, G	600 ml	HNO_3 to pH<2	6 mos	SW-846, 3rd edition, Vol 1-A; 7000 series	(9)
Hg (Total)	P, G	400 ml	HNO_3 to pH<2	28 days	SW-846, 3rd edition, Vol 1-A; 7470, 7471	(9)
Cr VI	P, G	400 ml	Cool, 4 deg C	24 hrs	SW-846, 3rd edition, Vol 1-A; 7195, 7196, 7197, 7198	(9)

*Holding time begins at time of sample collection.

Analysis of ORGANIC and INORGANIC Compounds Using USEPA SW-846 METHODOLOGIES for Aqueous, Non-aqueous, and Waste Samples

Parameter	Sample Container (1)	Container Volume	Preservation (2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Cyanide, total and amenable to chlorination	P, G	1 liter or larger	Cool, 4 deg, 0.6g ascorbic acid NAOH to pH>12	14 days	SW-846, 3rd edition, Vol 1-C, 7195,7196, 7197,7198	(9)
Total Organic Halides (TOX)	G, vials, teflon septa. Amber G, teflon lined cap/foil lined cap	250 ml	Cool, 4 deg C, dark, H_2SO_4 to pH<2, no headspace	7 days	SW-846, 3rd edition, Vol 1-C; 9020, 9022	(10)
Sulfides	P, G	1 liter (12)	Cool, 4 deg C, add 4 drops zinc acetate per 100 ml sample, NaOH to pH>9	7 days	SW-846, 3rd edition, Vol 1-C; 9030	(6)
Polychlor-inated Dibenzo-p-Dioxin (PCDDs) and Polychlor-inated Dibenzofurans (PCDFs)	G, with wide mouth w/teflon liner	1 pint	Cool, 4 deg C, dark	Extracted within 30 days and analyzed within 45 days of sampling	SW-846, 3rd edition, Vol 1-B; GC/MS-8280	(3)

*Holding time begins at time of sample collection.

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
MICROBIOLOGY CONTAMINANTS						
Total coliforms	P,G	125 ml	0.008% $Na_2S_2O_3$ if residual Cl_2, 0.3 ml/125 ml 15% EDTA if > 0.01 mg/l heavy metals, Cool, 4 deg C	30 hours	40 CFR 141	(8)
Fecal coliforms	As Above	As Above	As Above	As Above	As Above	As Above
Escherichia coli	As Above	As Above	As Above	As Above	As Above	As Above
Heterotrophic Plate Count	As Above	As Above	As Above	As Above	As Above	As Above
INORGANIC CONTAMINANTS AND NONTOXIC METALS						
Alkalinity	P,G	100 ml	Cool, 4 deg C	14 days	As Above	(20)
Asbestos (30)	As Above		As Above		As Above	
Calcium	As Above	100 ml	Conc. HNO_3 to pH<2 (26)	6 months	As Above	(9)
Chloride	As Above	As Above	None	28 days	40CFR141,143	(20)
Color	As Above	As Above	Cool, 4 deg C	24 hours	40 CFR 143	As Above
Conductivity	As Above	100 ml	As Above	As Above	40 CFR 141	As Above
Cyanide	As Above	500 ml	Cool, 4 deg C	14 days	40CFR141,143	As Above
Fluoride	As Above	300 ml	None	1 month	As Above	As Above
Foaming agents	As Above	250 ml	Cool, 4 deg C	48 hours	40 CFR 143	As Above

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Nitrate						
chlorinated	P,G	250 ml	Cool, 4 deg C	28 days	40 CFR 141	(20)
non-chlorinated	As Above	As Above	Conc. H_2SO_4 to pH<2	14 days	As Above	As Above
Nitrite	As Above	50 ml	Cool, 4 deg C	48 hours	As Above	As Above
Odor	G only	200 ml	As Above	24 hours	40 CFR 143	As Above
Orthophosphate (unfiltered)	P,G	50 ml	Cool, 4 deg C	24 hours	40 CFR 141	As Above
Residue, Non-filterable (TDS)	As Above	100 ml	Cool, 4 deg C	7 days	40 CFR 143	As Above
Residue-total filterable (TSS)	As Above	As Above	As Above	As Above	As Above	As Above
Silica	P only	50 ml	As Above	As Above	As Above	As Above
Sulfate	P,G	50 ml	As Above	28 days	As Above	As Above
Turbidity	As Above	100 ml	As Above	48 hours	As Above	As Above
ANALYZE IMMEDIATELY INORGANIC CONTAMINANTS						
Chlorine, residual	As Above	200 ml	None	15 minutes	As Above	As Above
Chlorine Dioxide	As Above		As Above	As Above	As Above	As Above
Ozone, residual	G, only		As Above	As Above	As Above	As Above
pH	P,G	25 ml	As Above	As Above	40CFR141,143	As Above
Temperature	As Above	1000 ml	As Above	As Above	40 CFR 141	As Above

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
INORGANIC CONTAMINANTS, TOXIC METALS(26)						
Aluminum, Total	P,G	100 ml	Conc HNO_3 to pH<2	6 months	40 CFR 143	(9)
Antimony, Total	As Above	As Above	As Above	As Above	40 CFR 141	As Above
Arsenic, Total	As Above	As Above	As Above	As Above	As Above	As Above
Barium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Beryllium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Cadmium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Chromium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Copper, Total	As Above	As Above	As Above	As Above	40CFR141,143	As Above
Iron, Total	As Above	As Above	As Above	As Above	40 CFR 143	As Above
Lead, Total	As Above	As Above	As Above	As Above	40 CFR 141	As Above
Manganese, Total	As Above	As Above	As Above	As Above	40 CFR 143	As Above
Mercury, Total	As Above	As Above	As Above	28 days	40 CFR 141	As Above
Nickel, Total	As Above	As Above	As Above	6 months	As Above	As Above
Selenium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Silver, Total	As Above	As Above	As Above	As Above	40CFR141,143 (31)	As Above
Sodium, Total	As Above	As Above	As Above	As Above	40 CFR 141	As Above
Thallium, Total	As Above	As Above	As Above	As Above	As Above	As Above
Zinc, Total	As Above	As Above	As Above	As Above	40 CFR 143	(9)

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
ORGANIC CONTAMINANTS, EXCLUDING GC/MS						
Chlorinated Hydrocarbons	G, foil or Teflon lined cap		Cool at 4 deg C ASAP after collection	extraction: 14 days analysis: 40 days	40 CFR 141 SM16-509A	(24)
Chlorophenoxys	As Above		As Above	extraction: 7 days analysis: 30 days	40 CFR 141: SM16-509B	(25)
Trihalomethanes-total (TTM)	G, narrow screw cap with PTFE-fluorocarbon faced silicone septa cap liner	25 ml (501.1) 40 ml (501.2)	2.5-3 mg/40 ml $Na_2S_2O_3$ or sodium sulfite	14 days	40 CFR 141 Method 501.1 Method 501.2	(4)
Trihalomethanes maximum potential	As Above	40 ml	25 deg C No reducing agent	Hold 7 days before analysis	As Above	As Above
Volatile Halogenated Organic Compounds	Screw cap vials, PTFE-faced silicone septum	40 ml - 120 ml	1:1 HCl to pH<2 Cool, 4 deg C until analysis	14 days	40 CFR 141 Method 502.1	As Above
Volatile Organic Compounds	As Above	As Above	As Above	As Above	40 CFR 141 Method 502.2	As Above

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Volatile Aromatic and Unsaturated Organic Compounds	Screw cap vials, PTFE faced silicone septum	40-120 ml	1:1 HCl to pH<2 Cool, 4 deg C until analysis	14 days	40 CFR 141 Method 503.1	(4)
EDB/DBCP	As Above	40 ml	Cool 4 deg C 0.08% $Na_2S_2O_3$ if residual Cl_2 1:1 HCl to pH<2	28 days	40 CFR 141 Method 504	As Above
Organohalide Pesticides and Commercial PCB Products (Arochlors)	As Above	As Above	3 mg $Na_2S_2O_3$ or 7 uL $Na_2S_2O_3$ (0.04 g/ml), Cool, 4 deg C until analyzed	If Heptachlor Extraction: 7 days Analysis: 40 days If no extraction analysis 14 days(28)	40 CFR 141 Method 505	(14)
Di-2(ethylhexyl) adipate Di-2(ethylhexyl) phthalate					40 CFR 141 Method 506	
Nitrogen- and Phosphorus-Containing Pesticides	Borosilicate w/graduations, screw caps lined with PTFE-fluorocarbon extracted with methanol overnight	1-liter	HgCl to produce concentrations of 10 mg/L, 80 mg $Na_2S_2O_3$ if residual Cl_2 Cool 4 deg C away from light until extraction	Extraction: disulfoton sulfoxide, diazinon pronamide, terbufos 7 days; 14 day extract holding time(28)	40 CFR 141 GC-Method 507	(23)

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Chlorinated Pesticides	Borosilicate w/graduations, screw caps lined with PTFE-fluorocarbon extracted with methanol overnight	1-liter	HgCl to produce concentration of 10 mg/L. Seal bottle and shake vigorously for 1 minute. Cool, 4 deg C until extraction	Extraction: 7 days Analysis: 14 days after extraction(28)	40 CFR 141 Method 508	(23)
PCBs (Screening)	As Above	As Above	Cool, 4 deg C	Extraction: 7 days Analysis: 30 days (28)	40 CFR 141 Method 508A	(23)
Chlorinated phenoxy Acids	As Above	As Above	80 mg $Na_2S_2O_3$ if residual Cl_2	Extraction: 14 days Analysis: 28 days	40 CFR 141 Method 515.1	(23)
N-Methyl Carbamoyloximes Carbamates	G, screw cap vials with PFTE-faced silicone	60 ml	1.8 ml monochloroacetic acid buffer. 80 mg $Na_2S_2O_3$ if residual Cl_2 Cool, 4 deg C	28 days	40 CFR 141 Method 531.1	(17)
Glyphosphate					40 CFR 141 Method 547	
Endothall					40 CFR 141 Method 548	
Diquat					40 CFR 141 Method 549	
Benzo(a)pyrene					40 CFR 141 Method 550 Method 550.1	

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
ORGANIC CONTAMINANTS, GC/MS						
Trihalomethanes	G, screw cap Teflon faced - silicone septum	25 ml	10 mg $Na_2S_2O_3$ or sodium sulfite	14 days	40 CFR 141 GC/MS 501.3 GC/MS (SIM) 501.3	(4)
2,3,7,8-TCDD (Dioxin)					40 CFR 141 Method 513	
Purgeable Organic Compounds	As Above	60-120 ml	1:1 HCl to pH <2 1 drop/20 ml Chill, 4 deg C	14 days	40 CFR 141 GC/MS-524.1 GC/MS-524.2	(4)
Organic Compounds	G, amber Teflon-lined screw caps	1-L or 1 quart	if residual Cl_2 40-50 mg sodium arsenite or sodium thiosulfate if unchlorinated 6 N HCl to pH < 2	Extraction: 7 days Analysis: 30 days	40 CFR 141 GC/MS-525.1 rev. 3.0	(16)
RADIOCHEMISTRY CONTAMINANTS, RADIOACTIVITY AND RADIONUCLIDES						
Gross Alpha & Beta	P,G		Conc. HNO_3 or HCl to pH 2		40 CFR 141	
Strontium 89,90	As Above		As Above		As Above	
Radium-total	As Above		As Above		As Above	
Radium-226	As Above		As Above		As Above	
Radium-228	As Above		As Above		As Above	
Ruthenium-106	As Above		As Above		As Above	
Cesium-134	As Above		Conc HCl to pH 2		As Above	
Cesium-137	As Above		As Above		As Above	

* Holding time begins at time of sample collection

Analysis of Contaminants Using SAFE DRINKING WATER Methodologies (including 500 series) for Aqueous Samples

Contaminants	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Cobalt-60	P,G		Conc. HNO_3 or HCl to pH 2		40 CFR 141	
Iodine-131	As Above		None		As Above	
Tritium	G		As Above		As Above	
Uranium	P,G		Conc. HNO_3 or HCl to pH 2		As Above	
Photon emmiters	As Above		As Above		As Above	
RADON IN DRINKING WATER						
Radon	G with Teflon-lined septum		Cool, 4 deg C		23 NJR 1423 N.J.A.C. 7:18	

* Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
BIOLOGICAL PARAMETERS						
Coliform (fecal)	P,G	125 ml	Cool, 4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2	6 hours	40 CFR 136.3	(8)
Coliform (fecal) chlorine present	As Above	As Above	As Above	As Above	As Above	As Above
Coliform (total)	As Above	As Above	As Above	As Above	As Above	As Above
Coliform (total) chlorine present	As Above	As Above	As Above	As Above	As Above	As Above
Fecal streptococci	As Above	As Above	As Above	As Above	As Above	As Above
Enterococci	As Above	As Above	As Above	As Above	SM17 9230 B;C	As Above
Heterotrophic Plate Count	As Above	As Above	As Above	As Above	SM17 9215B;C;D	As Above
Pseudomonas aeruginosa	As Above	As Above	As Above	As Above	SM17 9213 E;F	As Above
INORGANIC PARAMETERS, NUTRIENTS AND DEMANDS						
Acidity	As Above	100 ml	Cool, 4 deg C	14 days	40 CFR 136.3	(20)
Alkalinity	As Above	As Above	As Above	As Above	As Above	As Above
Ammonia (as N)	As Above	400 ml	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	As Above	As Above
Biochemical oxygen demand (BOD_5)	As Above	1000 ml	Cool, 4 deg C	48 hours	As Above	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Boron-total	P,G	100 ml	HNO_3 to pH<2	6 months	40 CFR 136.3	(9)
Bromide	P,G	100 ml	None Required	28 days	40 CFR 136.3	(20)
Calcium-total	As Above	100 ml	HNO_3 to pH<2	6 months	As Above	(9)
Carbonaceous biochemical oxygen demand ($CBOD_5$)	As Above	1000 ml	Cool, 4 deg C	48 hours	As Above	(20)
Chemical oxygen demand (COD)	As Above	50 ml	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	As Above	As Above
Chloride	As Above	As Above	None Required	As Above	As Above	As Above
Color	As Above	50 ml	Cool, 4 deg C	48 hours	As Above	As Above
Cyanide-total	As Above	500 ml	Cool, 4 deg C, NaOH to pH>12 0.6g ascorbic acid if residual Cl_2	sulfide absent 14 days sulfide present 24 hours(22)	As Above	As Above
Cyanide amenable to chlorination	As Above	As Above	As Above	As Above	As Above	As Above
Flouride-total	P	300 ml	None Required	28 days	As Above	As Above
Hardness-total	P,G	100 ml	HNO_3 to pH<2, H_2SO_4 to pH<2	6 months	As Above	As Above
Kjeldahl nitrogen -total (as N)	As Above	500 ml	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	As Above	As Above
Magnesium-total	As Above	100 ml	HNO_3 to pH<2	6 months	As Above	(9)

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Nitrate (as N)	P,G	100 ml	Cool, 4 deg C	48 hours	40 CFR 136.3	(20)
Nitrate-nitrite (as N)	P,G	100 ml	Cool, 4 deg C H_2SO_4 to pH<2	28 days	40 CFR 136.3	(20)
Nitrite (as N)	As Above	50 ml	Cool, 4 deg C	48 hours	As Above	As Above
Oil and grease -total recoverable	G	1000 ml	Cool, 4 deg C, HCl or H_2SO_4 to pH<2	petroleum based 3 days non-petroleum 24 hours	As Above	As Above
Organic carbon -total (TOC)	P,G	25 ml	As Above	As Above	As Above	As Above
Organic nitrogen (as N) (29)						
Orthophosphate (as P)	As Above	50 ml	Filter immediately, Cool, 4 deg C	48 hours	As Above	As Above
Oxygen-dissolved (Winkler)	G, bottle and top	300 ml	Fix on site and and store in dark	8 hours	As Above	As Above
Phenols	G only	500 ml	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	As Above	As Above
Phosphorus (elemental)	As Above	50 ml	Cool, 4 deg C	48 hours	As Above	As Above
Phosphorus-total	P,G	50 ml	Cool, 4 deg C, H_2SO_4 to pH<2	28 days	As Above	As Above
Potassium-total	P,G	100 ml	HNO_3 to pH<2	6 months	As Above	(9)
Residue-total	As Above	As Above	Cool, 4 deg C	7 days	As Above	(20)

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Residue-filterable (TDS)	P,G	100 ml	Cool, 4 deg C	7 days	40 CFR 136.3	(20)
Residue, non-filterable (TSS)	As Above	As Above	As Above	As Above	As Above	As Above
Residue-settleable	As Above	1000 ml	As Above	48 hours	As Above	As Above
Residue-volatile	As Above	100 ml	As Above	7 days	As Above	As Above
Salinity	G	100 ml	As Above	28 days	SM17-2520 B;C	As Above
Silica-dissolved	P	50 ml	Cool, 4 deg C	28 days	40 CFR 136.3	As Above
Sodium-total	P,G	100 ml	HNO_3 to pH<2	6 months	As Above	As Above
Specific conductance	As Above	100 ml	Cool, 4 deg C	28 days	As Above	(20)
Sulfate (as SO_4)	As Above	50 ml	As Above	As Above	As Above	As Above
Sulfide (as S)	As Above	500 ml	Cool, 4 deg C, add zinc acetate plus NaOH to pH>9	7 days	As Above	As Above
Surfacants	As Above	250 ml	Cool, 4 deg C	48 hours	As Above	As Above
Tannin and lignin	P,G	50 ml	Cool, 4 deg C	28 days	SM17-5550 B	As Above
Turbidity	P,G	100 ml	Cool, 4 deg C	48 hours	40 CFR 136.3	(20)

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
ANALYZE IMMEDIATELY (<15 MINUTES), INORGANIC PARAMETERS						
Chlorine-total residual	P,G	200 ml	None	Analyze immediately	40 CFR 136.3	(20)
Hydrogen ion (pH)	As Above	25 ml	None	As Above	As Above	As Above
Oxygen-dissolved (probe)	G, Bottle and Top	300 ml	None	As Above	As Above	As Above
Sulfite (as SO_3)	As Above	50 ml	None	As Above	As Above	As Above
Temperature	As Above	1000 ml	None	As Above	As Above	As Above
INORGANIC PARAMETERS, TOXIC METALS						
Aluminum-total	P,G	100 ml	HNO_3 to pH<2	6 months	As Above	(9)
Antimony-total	As Above	As Above	As Above	As Above	As Above	As Above
Arsenic-total	As Above	As Above	As Above	As Above	As Above	As Above
Barium-total	As Above	As Above	As Above	As Above	As Above	As Above
Beryllium-total	As Above	As Above	As Above	As Above	As Above	As Above
Cadmium-total	As Above	As Above	As Above	As Above	As Above	As Above
Chromium VI -dissolved	As Above	200 ml	Cool, 4 deg C	24 hours	As Above	As Above
Chromium-total	As Above	100 ml	HNO_3 to pH<2	6 months	As Above	As Above
Cobalt-total	As Above	As Above	As Above	As Above	As Above	As Above
Copper-total	As Above	As Above	As Above	As Above	As Above	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Gold-total	P,G	100 ml	HNO_3 to pH<2	6 months	40 CFR 136.3	(9)
Iridium-total	P,G	100 ml	HNO_3 to pH<2	6 months	40 CFR 136.3	(9)
Iron-total	As Above	As Above	As Above	As Above	As Above	As Above
Lead-total	As Above	As Above	As Above	As Above	As Above	As Above
Manganese-total	As Above	As Above	As Above	As Above	As Above	As Above
Mercury-total	As Above	As Above	HNO_3 to pH<2	28 days	As Above	As Above
Molybdenum-total	As Above	As Above	As Above	6 months	As Above	As Above
Nickel-total	As Above	As Above	As Above	As Above	As Above	As Above
Osmium-total	As Above	As Above	As Above	As Above	As Above	As Above
Palladium-total	As Above	As Above	As Above	As Above	As Above	As Above
Platinum-total	As Above	As Above	As Above	As Above	As Above	As Above
Rhodium-total	As Above	As Above	As Above	As Above	As Above	As Above
Ruthenium-total	As Above	As Above	As Above	As Above	As Above	As Above
Selenium-total	As Above	As Above	As Above	As Above	As Above	As Above
Silver-total	As Above	As Above	As Above	As Above	As Above	As Above
Thallium-total	As Above	As Above	As Above	As Above	As Above	As Above
Tin-total	As Above	As Above	As Above	As Above	As Above	As Above
Titanium-total	As Above	As Above	As Above	As Above	As Above	As Above
Vanadium-total	As Above	As Above	As Above	As Above	As Above	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Benzidines	amber glass or protect from light screw cap lined with Teflon (or foil if sample not corrosive)	1 liter	Cool, 4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2 store in dark H_2SO_4 to pH 2-7 if 1,2-diphenyl hydrazine is likely to be present:pH to 4.0 +/- 0.2	Extraction 7 days Analysis 7 days after extraction if stored under inert (oxidant free) atmosphere	40 CFR 136.3 HPLC-605	(4)
Phthalate esters	As Above	As Above	Cool, 4 deg C	7 days until extraction 40 days after extraction	40 CFR 136.3 GC-606	As Above
Nitrosamines	As Above	As Above	Cool, 4 deg C, store in dark 0.008% $Na_2S_2O_3$ if residual Cl_2 for determination of N-nitrosodiphenylamine NaOH or H_2SO_4 to pH 7-10.	As Above	40 CFR 136.3 GC-607	As Above
Organochlorine Pesticides & PCBs	As Above	1 liter 1 quart	Cool, 4 deg C $NaOH/H_2SO_4$ to pH 5-9 if aldrin to be determined. 0.008% $Na_2S_2O_3$ if residual Cl_2	Extraction 72 hours w/o pH adjustment 7 days with pH adjustment 40 days after extraction	40 CFR 136.3 GC-608	As Above
Nitroaromatics and isophorone	As Above	As Above	Cool, 4 deg C, dark 0.008% $Na_2S_2O_3$ if residual Cl_2	7 days until extraction 40 days after extraction	40 CFR 136.3 GC-609	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Polynuclear aromatic hydrocarbon	Amber glass or protect from light screw cap lined with Teflon (or foil if sample not corrosive)	1 liter	Cool, 4 deg C, dark 0.008% $Na_2S_2O_3$ if residual Cl_2	7 days until extraction 40 days after extraction	40 CFR 136.3 HPLC-610	(4)
Haloethers	As Above	As Above	As Above	As Above	40 CFR 136.3 GC-611	As Above
Chlorinated Hydrocarbons	As Above	As Above	Cool, 4 deg C	As Above	40 CFR 136.3 GC 612	As Above
ORGANIC PARAMETERS, MASS SPECTROMETRY						
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (TCDD)	G, screw cap lined with Teflon (or foil if sample not corrosive) amber glass or protect from light	1 liter	Cool, 4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2	As Above	40 CFR 136.3 GC/MS-613	(13)
Purgeables [except benzene toluene ethyl benzene(32)]	G, Teflon faced silicone septum, screw cap with hole in center	25 ml or larger	As Above	14 days	40 CFR 136.3 GC/MS-624	(4)
Purgeables [benzene toluene ethylbenzene(32)]	As Above	As Above	Cool, 4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2 1:1 HCl to pH<2	Without HCl 7 days With HCl 14 days	As Above	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Base/Neutrals and Acids	G, screw cap lined with Teflon (or foil if sample not corrosive amber bottle or protect from light	1 liter 1 quart	Cool, 4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2	7 days until extraction 40 days after extraction	40 CFR 136 GC/MS-625	(13)
Volatile Organic Compounds by Isotope Dilution GC/MS [except benzene, toluene ethyl benzene(32)]	G, Teflon-faced silicone septum, screw cap with center hole	25 ml to 40 ml	Cool, 0-4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2,	14 days	40 CFR 136 GC/MS-1624	(4)
Volatile Organic Compounds by Isotope Dilution GC/MS [benzene, toluene, ethyl benzene only(32)]	As Above	As Above	Cool, 0-4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2 1:1 HCl to pH<2	Without HCl 7 days With HCl 14 days	As above	(4)
Semivolatile Organic Compounds by Isotope Dilution GC/MS	Amber glass or protect from light Teflon lined cap (or aluminum foil if sample non-corrosive)	1.1 liter or greater	Cool, 0-4 deg C, 0.008% $Na_2S_2O_3$ if residual Cl_2	As Above	40 CFR 136 GC/MS-1625	(14)

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
PESTICIDES TESTS						
Organochlorine Pesticides & PCBs	Amber glass or protect Teflon lined cap (or aluminum foil if sample not corrosive)	1 liter 1 quart	Cool, 4 deg C $NaOH/H_2SO_4$ to pH 5-9 if aldrin to be determined add 0.008% $Na_2S_2O_3$ if residual Cl_2	Extraction 72 hours w/o pH adjustment 7 days with pH adjustment 40 days after extraction	40 CFR 136.3 GC-608	(14)
AQUATIC TOXICITY						
Dilution Water	wide mouth lead free glass or unplasticized plastic container	30 liters	none	96 hours	N.J.A.C. 7:18- Subchapter 6	(27)
Effluent	As Above	15 liters	<2hr: test temp. >2hr: Cool, 4 deg C	24 hours	As Above	(27)
RADIOCHEMISTRY PARAMETERS, RADIOACTIVITY AND RADIONUCLIDES						
Alpha-total	P,G		HNO_3 to pH<2	6 months	40 CFR 136.3	(9)
Alpha-counting error	As Above		As Above	As Above	As Above	As Above
Beta-total	As Above		As Above	As Above	As Above	As Above
Beta-counting error	As Above		As Above	As Above	As Above	As Above
Radium-total	As Above		As Above	As Above	As Above	As Above
Radium-226	As Above		As Above	As Above	As Above	As Above

*Holding time begins at time of sample collection

Analysis of Parameters Using CLEAN WATER ACT NPDES (NJPDES) Methodologies for WASTEWATER Samples

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
RADON IN WASTEWATER						
Radon	P,G		HNO_3 to pH<2	6 months	[illegible] 22 May 1992	(9)

*Holding time begins at time of sample collection

ANALYSIS OF PARAMETERS USING SLUDGE METHODOLOGIES FOR SLUDGE SAMPLES

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
METALS						
Chromium VI	P,G	400 ml	Cool, 4 deg C	48 hours	SW-846	(9)
Mercury	As Above	500 ml	HNO_3 to pH<2	28 days	SW-846	As Above
Metals	As Above	1000 ml	As Above	6 months	DEP 100	As Above
ORGANIC COMPOUNDS						
Extractables (including phthalates, nitrosamines, organochlorine pesticides, PCBs, nitroaromatics, isophorone, polynucTear aromatic hydrocarbons, haloethers, chlorinated hydrocarbons and TCDD)	G, Teflon-lined cap	1000 ml	Cool, 4 deg C 0.008% $Na_2S_2O_3$ if residual Cl_2	Extraction: 7 days Analysis: 30 days	625s	(13)
Extractables (phenols)	As Above	As Above	Cool, 4 deg C H_2SO_4 to pH<2 0.008% $Na_2S_2O_3$ if residual Cl_2	As Above	As Above	As Above
Purgeables (Halocarbons and Aromatics	G, Teflon-lined septum	50 ml	Cool, 4 deg C 0.008% $Na_2S_2O_3$ if residual Cl_2 HCl to pH<2	14 days	624s	(18)

* Holding time begins at time of sample collection

ANALYSIS OF PARAMETERS USING SLUDGE METHODOLOGIES FOR SLUDGE SAMPLES

Parameter	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
Purgeables (Acrolein and Acrylonitrile	G, Teflon lined septum	40 ml	Cool, 4 deg C 0.008% $Na_2S_2O_3$ if residual Cl_2	14 days	624s	(18)
Pesticides	G, Teflon-lined cap	1000 ml	As Above	Extraction: 7 days Analysis: 30 days	625s	(13)
pH			Cool, 4 deg C		DEP 010	(19)
Residue total	P,G wide mouth air tight		As Above		DEP 012	(20)
Residue, volatile, ash	As Above		As Above		DEP 013	As Above
Phenols	P,G wide mouth		As Above		DEP 032	As Above
Oil and Grease	As Above		As Above		DEP 036	As Above

* Holding time begins at time of sample collection

Analysis of BIOLOGICAL Samples Using NJDEPE Methodologies for Freshwater, Esturine And Marine Samples

Contaminant	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
PHYTOPLANKTON						
FRESHWATER						
Species Composition						
(live samples)	P,G	250 ml	Cool, 4 deg C	24 hours	SM17:10200 EPA73: Plankton 3,4	(20)
(preserved)	As Above	1000 ml	50 ml neutralized formalin Store/transport in dark, cool container	1 month	As Above	As Above
Chlorophyll a	P,G amber or foil-covered	250 ml	Cool, 4 deg C store/transport in dark	48 hours	SM17:10200H EPA73: Plankton 5.2	As Above
MARINE AND ESTUARINE						
Species Composition						
(live samples)	P,G	250 ml	Cool, 4 deg C	24 hours	SM17:10200 EPA73: Plankton 3,4	As Above
(preserved)	As Above	1000 ml	10 ml or more Lugol's solution to maintain weak tea color. Store/transport in dark, cool container.	48 hours	As Above	As Above

* Holding time begins at time of sample collection

Analysis of BIOLOGICAL Samples Using NJDEPE Methodologies
for Freshwater, Esturine And Marine Samples

Contaminant	Sample Container(1)	Container Volume	Preservation(2)	Maximum Holding Time*	Analytical Methodology	Sample Container Cleaning
PHYTOPLANKTON						
MARINE AND ESTUARINE						
Chlorophyll a	P,G amber or foil-covered	250 ml	Cool, 4 deg C Store/transport in dark.	48 hours	SM17:10200H EPA73: Plankton 5.2	(20)
ZOOPLANKTON						
Freshwater	P,G	6,000 ml	300 ml neutralized formalin. Store in cool container	1 month	SM17: 10200 EPA73: Plankton 3,4	As Above
Marine & Estuary	As Above	As Above	5% formalin (5 ml) neutralized formalin/100 ml tap water), store and transport in cool container	As Above	As Above	As Above
PERIPHYTON						
DIATOMETER SLIDES AND ROCK SCRAPINGS						
Species composition	120 ml jar polyseal cap	N/A	5% formalin (5 ml neutralized formalin/100 ml tap water), store and transport in cool container	1 month	SM17: 10300 EPA73: Periphyton 3	As Above

* Holding time begins at time of sample collection

heating. Seal and store in clean environment. Store inverted or capped with aluminum foil.

24. Rinse with water or last solvent used. Detergent wash, tap rinse, redistilled acetone rinse, pesticide quality hexane rinse. Heat in muffle furnace at 400-500 degrees Celsius for 30 minutes to overnight. Store inverted or cover with aluminum foil.

25. Detergent wash, rinse in dilute HCl and then distilled water. Rinse with redistilled acetone rinse, pesticide quality hexane rinse. Heat in muffle furnace at 400-500 degrees Celsius for 30 minutes to overnight. Store inverted or cover with aluminum foil.

26. If HNO_3 cannot be used because of shipping restrictions, samples may be initially preserved by icing and immediately shipping to the laboratory. Upon receipt in the laboratory, the sample must be acidified with conc. HNO_3 to pH<2. At time of analysis, sample container should be thoroughly rinsed with 1:1 HNO_3; washings should be added to sample.

27. Cleaning of all chambers and equipment shall be in accordance with the following procedures:

As soon after breaking down a test as is practical, rinse with acetone to remove organic compounds and then rinse twice with laboratory grade freshwater; and secondly, soak and wash with a warm synthetic detergent/laboratory grade freshwater solution, and then rinse with 50 degrees Celsius or warmer laboratory grade water; and

Finally, rinse with a fresh 5% hydrochloric or nitric acid solution, for the removal of metals and bases, and then rinse again with 50 degrees Celsius or warmer laboratory grade freshwater.

28. NJDEPE recommended holding time for sample extraction and analysis.

29. No test; calculated as total Kjeldahl Nitrogen minus Ammonia Nitrogen

30. Proposed under Safe Drinking Water Act - size of community dependent.

31. CFR 141 is under final rule to change from CFR 143.

32. Evidence indicates that some aromatic compounds, notably benzene, toluene and ethylbenzene are succeptble to rapid biodegradation under certain environmental conditions. Refrigeration alone may not be adequate to preserve these compounds in wastewaters for more than seven days. For this reason, a separate sample should be collected, acidified, and analyzed when these aromatics are to be determined.

Attachment 3

SW-846 Methods Trip and Field Blank Requirements

Parameter	Sample Container Volume	Preservation	Maximum Hold Time*	Analytical Methodology	Sample Container Cleaning
Volatile Organics	G vial Teflon lined septum 40ml	4 drops conc, HCl, cool 4°C	14 days	SW-846, 3d edition, Vol 1-B, GC 8010,8015 GC/MS 8240	5
Semi-Volatile Organics	Amber G, Teflon Lined Cap 1000ml	Cool, 4°C Dark	Extraction-7 days Analysis-40 days from extraction	SW-846, 3d edition, Vol 1-B,* GC/MS 8270	5
Organo-chlorine Pesticides and PCBs	As Above	As Above	As Above	SW-846, 3d edition, Vol 1-B, GC 8080	5
Organo-chlorine Pesticides	As Above	As Above	As Above	As Above	As Above
PCBs	As Above	As Above	As Above	As Above	As Above
Metals except Hg and Cr^{+6}	P Bottle, P Cap, P Liner 1000ml	HNO_3 to pH<2	180 days	SW-846, 3d edition, Vol 1-A, 7000 series	9
Hg	As Above	As Above	28 days	As Above	9

Attachment 3

SW- 846 Methods Trip and Field Blank Requirements

Parameter	Sample Container Volume	Preservation	Maximum Hold Time*	Analytical Methodology	Sample Container Cleaning
Total Petroleum Hydrocarbons	G, 1000ml	Cool, 4°C	7days	SW-846, 3d edition, Vol 1-C, Method 418.1	7

*Holding time begins at time of sample collection

CLP Methods Trip and Field Blank Requirements

Parameter	Sample Container Volume	Preservation	Maximum Hold Time*	Analytical Methodology	Sample Container Cleaning
Volatile Organics	G, Black phenolic plastic screw cap teflon-lined septum 40 ml	Cool, 4°C Dark	10 days	USEPA-CLP Statement of Work for Inorganic Analysis. Multi-media Multi-Concentration (Doc.#OLM01.8)5/90	3
Semi-Volatile Organics	Amber G, Teflon Lined Cap 1000ml	Cool, 4°C Dark	Extraction-Continuous liquid-liquid extraction must be started within 5 days Analysis-days from VTSR*		As Above
Organo-chlorine Pesticides and PCBs	As Above	As Above	As Above		As Above
Organo-chlorine Pesticides	As Above	As Above	As Above		As Above
PCBs	As Above	As Above	As Above		As Above

CLP MethodTrip and Field Blank Requirements

Parameter	Sample Container Volume	Preservation	Maximum Hold Time*	Analytical Methodology	Sample Container Cleaning
Inorganics except Hg and Cyanide	P Bottle, P Cap, P Liner 1000ml	HNO_3 to pH<2	180 days	USEPA-CLP Statement of Work for Inorganic Analysis Multi-media Multi-Concentration	As Above
Hg	As Above	As Above	26 days		As Above

*Validated time of sample receipt (at the laboratory)

Cyanide	As Above	NaOH to pH<2, 4°C until analyzed	12 days	As Above	As Above

ENVIROTECH RESEARCH SOP No. S102
STANDARD OPERATING PROCEDURE
FOR SAMPLE BOTTLE CONTROL AND CLEANING

doc: S102
Revision:

1. SCOPE and APPLICATION

1 1. The following procedure is used to receive precleaned sampling bottles, label the cases and store the bottles in a manner that facilitates using the oldest bottles first (stock rotation).

2. APPARATUS

2.1. Material Receiving Labels

3. PROCEDURE

3.1. All sampling bottles are purchased from a vendor, presently Eagle Picher, who cleans the containers as outlined below.

3.2. The Sample Receipt Login Technician is responsible for ordering bottles and maintaining the inventory of bottles

3.3. The sampling bottles are cleaned by either Procedure A, B or C. These procedures are as follows:

3.3.1. Wash Procedure A - used for all glass wide mouth jars and Boston Round bottles.

3.3.1.1. Bottles, liners and caps are washed in laboratory grade, non-phosphate detergent.
3.3.1.2. Rinsed three times with distilled water.
3.3.1.3. Rinsed with 1:1 nitric acid
3.3.1.4. Rinsed three times with ASTM Type 1 organic free water.
3.3.1.5. Oven dried for one hour.
3.3.1.6. Rinsed with hexane.
3.3.1.7. Oven dried for one hour.

3.3.2. Wash Procedure B - used for any bottles to contain samples for volatile organic analysis.

3.3 2.1. Bottles, septa and caps are washed in laboratory grade, non-phosphate detergent.
3.3.2.2. Rinsed three times with distilled water.
3.3.2.3. Rinsed three times with ASTM Type 1 organic free water.

3.3 2.4.Oven dried for one hour.

3.3.3. Wash Procedure C - used for all high density polyehtylene bottles

3.3.3.1.Bottles, liners and caps are washed in laboratory grade, non-phosphate detergent.
3.3.3.2.Rinsed three times with distilled water.
3.3.3.3.Rinsed with 1:1 nitric acid
3.3.3.4.Rinsed three times with ASTM Type 1 organic free water.
3.3.3.5.Air dried.

3.4. Sample bottles are received in the loading dock area. Every case of bottles is labeled with a tag that bears the date the bottles are received and the individual who received them.

3.5. The sample bottles are transported to the sample bottle room which is in an organic free section of the laboratory. The newly received cases of bottles are placed in the rear of the racks which hold the bottles. The bottles with the oldest date of receipt are moved to the front of the rack so that they are consumed first.

3.6. With every new shipment of bottles, a bottle is randomly selected for each bottle type received. If a bottle type has potential use for more than one analysis, additional bottles are selected. These bottles are filled with analyte free water and are used to create the following days method blank for the analysis for which they will be used. If subsequent analysis produces any positive result, the entire shipment of bottle type is removed from inventory and subjected to another check. If this subsequent check confirms the first check, the entire shipment of bottle type is rejected and returned to the vendor. At no time are bottles to be issued to a client without undergoing this checking procedure.

ENVIROTECH RESEARCH SOP No. S100.1
STANDARD OPERATING PROCEDURE
FOR MAINTAINING SAMPLE CHAIN OF CUSTODY

doc: S100.1
Revision:

1. SCOPE and APPLICATION

1 1. The following procedure details all required aspects of maintaining and executing Chain of Custody control documents for environmental samples from private clients and under government contracts except for samples submitted by NJDEP under the X-26174 contract.

1.2. Analysis requests from NJDEP for analytical services in accordance with the X-26174 contract requires the use of NJDEPE forms 095 or 096 and NJDEP form 077 for internal Chain of Custody described in Envirotech Research SOP No. S100.

1.3. This Chain of Custody procedure is designed to create a written record of everyone in custody of the sample from the time of collection to its disposal

1.4. A sample is in an individual's "custody" if it is in his actual physical possession or sight or if it is secured in a restricted area of limited access.

2. APPARATUS

Attachment 1, Custody Seal
Attachment 2, Chain of Custody
Attachment 3, Instructions for Chain of Custody
Attachment 4, Common Abbreviations for Laboratory Tests
Attachment 5, Internal Custody Record and Lab Chronicle

3. PROCEDURE

3.1. Upon receiving a Request for Bottle Order, the Sample Custody Officer or his assistant prepares a sample shipment container in accordance with Envirotech Research SOP No. S101 and initiates an Envirotech Research Chain of Custody document for the contents of the cooler. A Custody Seal is used to seal each cooler. See Attachment 1 for an example Custody Seal.

3.2 The appropriate information is entered on the Envirotech Research Chain of Custody, including but not limited to container type, number of containers and preservation reagents. One Chain of Custody form may be used for the entire shipment of containers.

3.3. The Sample Custody Officer or his assistant relinquishes the custody of the sampling container(s) to the sampling team by signing the first "Relinquished by" box on the bottom of the Chain of Custody document. A member of the sampling team signs the adjacent "Received by" box on the bottom of the form and assumes custody of the container(s).

3.4. Upon return to the laboratory, a member of the sampling team who assumed custody of the containers relinquishes custody of them back to the Sample Custody Officer or his assistant.

3.5. At this point, either a client Chain of Custody form or another Envirotech Research Chain of Custody form is initiated. Each sampling point is entered on one line. If the Envirotech Research Chain of Custody document is used and the total number of samples taken exceeds ten, then additional forms are added as required. A example of the Envirotech Research Chain of Custody form is given in Attachment 2. Instructions for the Chain of Custody are given in Attachment 3. Common abbreviations used to request laboratory analysis are given in Attachment 4.

3.6. The Sample Custody Officer or his assistant then checks the actual samples against the information on the Chain of Custody form. If there are any errors or discrepancies, they are corrected at this point in time and initialed. The custody of the samples is then signed from the sampling crew to the Sample Custody Officer or his representative and logged into the laboratory and placed in a locked refrigerator in accordance with Envirotech Research SOP No. S103.

3.7. For sampling containers received by common carrier, the shipping documents are to be retained to document their possession with the shipper and the Sample Custody Officer will accept custody as of the time the container is opened in the laboratory.

3.8. The completed Chain of Custody is placed in the Job Folder in the Document Control Area.

3.9. INTERNAL CHAIN OF CUSTODY

3.9.1. After the samples have been logged in per Envirotech Research SOP S103, an "Internal Custody Record and Laboratory Chronicle" is initiated for each sample received by the laboratory. An example is given in Attachment 5:

The Internal Custody Record and Laboratory Chronicle contains, among other information, the client name, site name, sample number, matrix, date sampled and date received in the header. Along the left column, each analysis requested is listed. The Internal Custody Record and Laboratory Chronicle tracks the sample through the laboratory and identifies by whom and when preparation and analysis of each parameter is performed. The Lab Chronicle also references the Quality Assurance batch number for each parameter analyzed for the sample.

3.9.2. The Laboratory Chronicles are maintained in the Job Folder in accordance with Envirotech Research SOP No. D100

ATTACHMENT 1

1304

CUSTODY SEAL

Person Collecting Sample _____ Sample No. _____
(signature)

Date Collected _____ Time Collected _____

1304

\ !OTECH RESEARCH INC.
777 New Durham Road
Edison, New Jersey 08817
Phone (908) 549-3900 Fax (908) 549-3679

CHAIN OF CUSTODY / ANALYSIS REQUEST

PAGE ___ OF ___

Name (for report and invoice)	Samplers Name (Printed)	Site/Project Identification
Company	P O #	State (Location of site) NJ ☐ NY ☐ Other
		Regulatory Program
Address	Analysis Turnaround Time Standard ☐	ANALYSIS REQUESTED (ENTER "X" BELOW TO INDICATE REQUEST)
City State Zip	Rush Charges Authorized For 2 Week ☐ 1 Week ☐	LAB USE ONLY Project No:
Phone Fax	Other ☐	Job No:

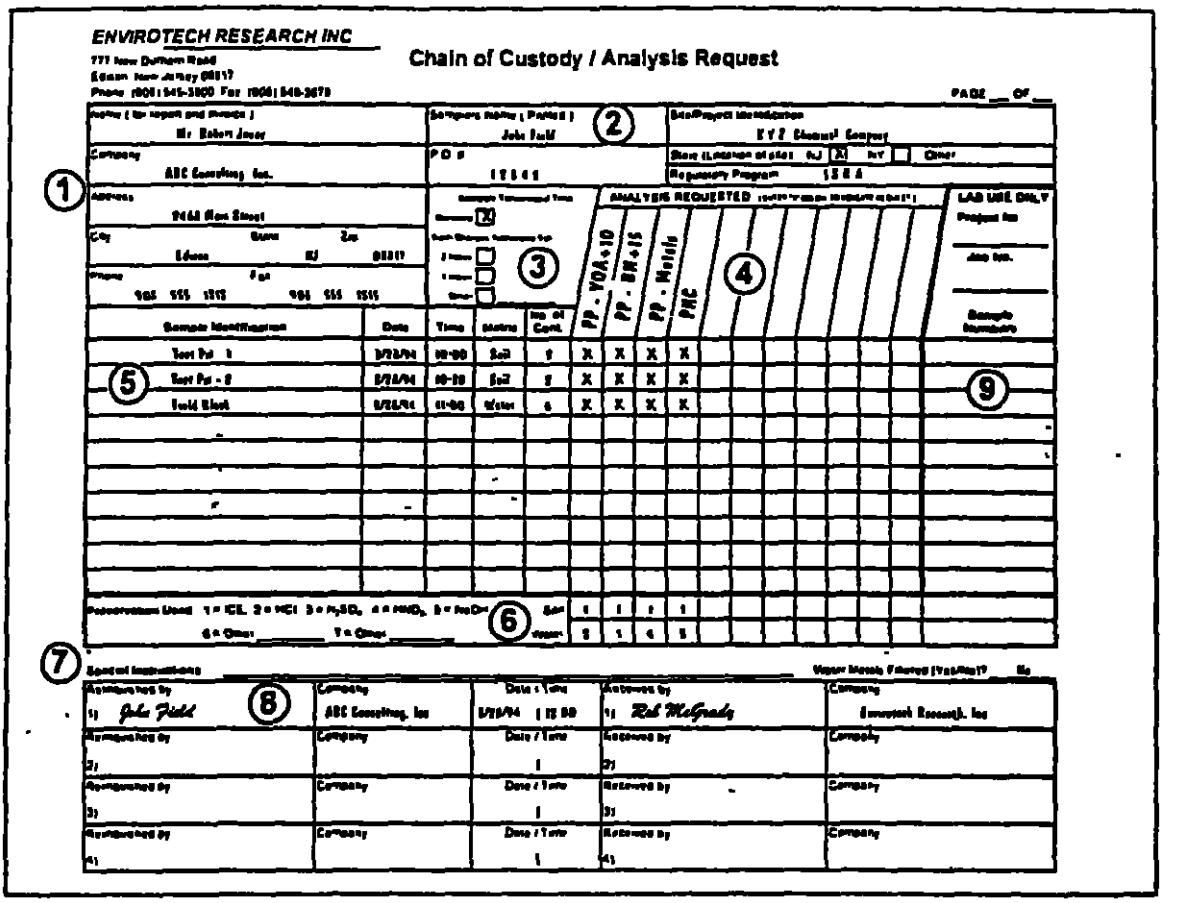
Sample Identification	Date	Time	Matrix	No. of Cont.												Sample Numbers
Preservation Used: 1 = ICE, 2 = HCl, 3 = H_2SO_4, 4 = HNO_3, 5 = NaOH Soil:																
6 = Other _____, 7 = Other _____ Water:																

Special Instructions: _____ Water Metals Filtered (Yes/No)? _____

Relinquished by	Company	Date / Time	Received by	Company
1)		/	1)	
Relinquished by	Company	Date / Time	Received by	Company
2)		/	2)	
Relinquished by	Company	Date / Time	Received by	Company
3)		/	3)	
Relinquished by	Company	Date / Time	Received by	Company
4)		/	4)	

ATTACHMENT 2

Instructions: Chain of Custody / Analysis Request Form



1. Provide the name, address and phone and fax number of the person who is to receive the analytical report and invoice.

2. Print the name of the sampler, the site/project name, the state the site is located in and the type of regulatory program under which the analysis falls. **Please provide the Envirotech Quote/Project number with the Project Identification Information. If your company requires a purchase order number (P.O.#) for payment of laboratory services, please provide it in the noted box.**

3 Note the required analysis turnaround time Standard analysis turnaround time for complex projects is approximately 15 to 20 work days Standard turnaround time for other projects (i.e. VOAs, PHC, and most general chemistry) is approximately 10 to 15 work days Rush analytical services will be provided upon request with the following surcharges applied to standard unit prices

2 Week Rush (10 work days) for a 25% surcharge;
1 Week Rush (5 work days) for a 50% surcharge,
Less Than 5 Work Day service for a 100% surcharge.

Rush Total Petroleum Hydrocarbon testing is not subject to this surcharge policy and is offered faster and at lower rush price surcharges Please see our price list for details.

(Over)

4 List the analyses you would like performed under "Analysis Requested" Place one analysis per column starting at the left column. You may use common abbreviations Please see our list of common abbreviations for laboratory tests

5. Place the sample descriptions (as you wish them to appear in your laboratory report) in the Sample Identification column. Note the date of sampling, time of sampling, the sample matrix (soil/water) and the number of containers for each sample. **Place an "X" under the appropriate type of analysis for each sample to indicate your request for each required analysis.**

6 Note the preservation used for soil and water samples by placing the correct number code in each box. Most soil samples must be preserved by cooling to ice temperature (#1) Water preservatives are generally noted on the containers provided by the laboratory. Two separate lines are provided for soil and water preservation information so that both soil and water sample preservation information can be provided.

7 Place special instructions on the space provided. Also, note whether the any water samples being tested for metals have been field filtered.

8. The signature of the person who's name is printed in the "Samplers Name" box must appear in the first "Relinquished by" box. His/her company name must follow as well as the date and time of change in sample custody. The person receiving the samples must then sign and provide their company affiliation. This procedure must be followed each time samples change custody.

9. Please do not use the section noted "Lab use only". This section is required by the laboratory for identification of laboratory samples.

Common Abbreviations for Laboratory Tests

Priority Pollutants (PP)

PP - VOA - Priority Pollutant Volatile Organic Analysis with xylenes
PP - VOA + 10 - Priority Pollutant Volatile Organic Analysis with xylenes plus a GC/MS library search for up to 10 non-target compounds
PP - BN - Priority Pollutant Base/Neutral Extractable Organics
PP - BN + 15 - Priority Pollutants Base/Neutral Extractable Organics plus a GC/MS library search for up to 15 non-target compounds
PP - BNA - Priority Pollutant Base/Neutral and Acid Extractable Organics
PP - BNA + 25 - Priority Pollutant Base/Neutral and Acid Extractable Organics plus a GC/MS library search for up to 25 non-target compounds
PP - Metals - Priority Pollutant Metals (13 elements - As, Sb, Be, Cd, Cr, Cu, Ni, Pb, Hg, Se, Ag, Tl, Zn)
PP - PCB/Pest - Priority Pollutant Polychlorinated Biphenyls (PCBs) and Organochlorine Pesticides
PP + 40 - Priority Pollutants + 40 (PP-VOA+15, PP-BNA+25, PP-PCB/Pest, and PP-Metals)
PP - PAH - Priority Pollutant Polynuclear Aromatic Hydrocarbons

Target Compound List (TCL) and Target Analyte List (TAL):

TCL - VOA + 10 - Target Compound List Volatile Organic Analysis plus a GC/MS library search for up to 10 non-target compounds
TCL - BN + 10 - Target Compound List Base/Neutral Extractable Organics plus a GC/MS library search for up to 10 non-target compounds
TCL - BNA + 20 - Target Compound List Base/Neutral and Acid Extractable Organics plus a GC/MS library search for up to 20 non-target compounds
TAL - Metals - Target Analyte List Metals (23 elements - Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn)
TCL - PCB/Pest - Target Compound List Polychlorinated Biphenyls (PCBs) and Organochlorine Pesticides
TAL/TCL + 30 - Target Analyte List and Target Compound List +30 (TCL-VOA+10, TCL-BNA+20, TCL-PCB/Pest, TAL-Metals)
CN - Cyanide

EPA Contract Laboratory Program (CLP):

TCL/TAL Analysis is provided by the EPA's CLP statement of work. When CLP analysis is required, please clearly specify "CLP" analysis in the Special Instructions section. The laboratory will follow SW-846 methods for TCL and TAL analysis unless "CLP" analysis is specified.

Waste Characteristic Testing:

TCLP - Toxicity Characteristic Leaching Procedure (Full TCLP), Including:

1. TCLP Zero Headspace Extraction
2. TCLP Inorganic and Semivolatile Organic Extraction
3. TCLP-VOA - TCLP Volatile Organics Analysis
4. TCLP-BNA - TCLP Base/Neutral and Acid Extractable Organics Analysis
5. TCLP Metals
6. TCLP-Pest - Pesticides
7. TCLP-Herb - TCLP Herbicides

For individual TCLP fractions note the specific test required, i.e. TCLP-VOA or TCLP-Metals

I,C,R - Ignitability, Corrosivity, and Reactivity (for Cyanide and Sulfide)
PCB - Polychlorinated Biphenyls
PHC - Total Petroleum Hydrocarbons

(Over)

Volatile Organic Profiles:

Ac & Ac - Acrolein and Acrylonitrile by methods 603/8030
BTEX - Benzene, Toluene, Ethylbenzene and Xylenes by methods 602/8020
BTEX by MS - Benzene, Toluene, Ethylbenzene and Xylenes by methods 624/8240
MTBE - Methyl tertiary butyl ether
TBA - Tertiary butyl alcohol
DIPE - Diisopropylether

Petroleum Discharge Evaluation Analyses:

Fingerprint - GC-FID Hydrocarbon Product Identification
GRO - Gasoline Range Organics (PHC by GC)
DRO - Diesel Range Organics (PHC by GC)
3650 Cleanup - Acid-Base Partition Cleanup
3611 Cleanup - Alumina Column Cleanup

Individual Metals:

Al	Aluminum	Co	Cobalt	P-ICP	Phosphorus by ICP
B	Boron	Cu	Copper	Se	Selenium
Sb	Antimony	Fe	Iron	Ag	Silver
As	Arsenic	Au	Gold	Na	Sodium
Ba	Barium	Pb	Lead	Sr	Strontium
Be	Beryllium	Mg	Magnesium	Tl	Thallium
Cd	Cadmium	Mn	Manganese	Sn	Tin
Ca	Calcium	Hg	Mercury	Ti	Titanium
Cr	Chromium, Total	Mo	Molybdenum	V	Vanadium
Cr^{+6}	Chromium, Hexavalent	Ni	Nickel	Zn	Zinc
		K	Potassium		

General Chemistry:

Alk - Alkalinity, as $CaCO_3$
Br - Bromide
CO_2 - Carbon Dioxide, Free
CEC - Cation Exchange Capacity
COD - Chemical Oxygen Demand
Cl - Chloride
CN - Cyanide
F^- - Fluoride
Hrd - Hardness
Herb - Herbicides (2,4-D and 2, 4, 5-TP)
NH_3 - Ammonia Nitrogen
NO_3 - Nitrate Nitrogen
NO_2 - Nitrite Nitrogen
O & G - Oil and Grease, Gravimetric
O & G, IR - Oil and Grease by IR
ORP - Oxidation Reduction Potential
PO_4 - Orthophosphate
P - Phosphorus, Total
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
TS - Total Solids
TVS - Total Volatile Solids
SS - Settleable Solids
Sp. Cond. - Specific Conductance
SO_4 - Sulfate
S^{-2} - Sulfide
TOC - Total Organic Carbon
PHC - Total Petroleum Hydrocarbon

ATTACHMENT 5

INTERNAL CUSTODY RECORD AND LABORATORY CHRONICLE

ENVIROTECH RESEARCH, INC.

777 NEW DURHAM ROAD, EDISON, NJ 08817
(908) 549-3900

Client: ENVIROTECH RESEARCH, INC. Date Sampled: 6/9/94

Site: XYZ Chemical Co. Date Received: 6/9/94

Matrix: SOLID Job No.: G780

Sample No.: 98318

Analytic Parameter	Extraction Date	Extractor's Name	Analysis Date	Analyst's Name	QA Batch
PPVOA+15	--	--	6/14/94	Sue Purge	4385
PPBNA+25	6/11/94	John Tech	6/15/94	Dave Chemist	5678
PP PEST/PCB	6/11/94	Bob Smith	6/16/94	Tom Jones	6789
ANTIMONY	6/13/94	Jim Nitric	6/17/94	Jane Doe	7890
ARSENIC	↓	↓	↓	↓	↓
BERYLLIUM					
CADMIUM					
CHROMIUM					
COPPER					
LEAD					
MERCURY	6/11/94	Joe Base	6/11/94	Joe Base	
NICKEL	6/13/94	Jim Nitric	6/17/94	Jane Doe	
SELENIUM	↓	↓	↓	↓	
SILVER					
THALLIUM					
ZINC	↓	↓	↓	↓	↓

ENVIROTECH RESEARCH SOP No. M102
STANDARD OPERATING PROCEDURE
FOR PREVENTIVE MAINTENANCE and CALIBRATION PROCEDURES
FOR ALL ANALYTICAL INSTRUMENTS and ANCILLARY EQUIPMENT

doc: M102
Revision:

1 SCOPE and APPLICATION

1.1. The following procedure outlines the steps taken to ensure that instruments and ancillary equipment are in condition to perform their respective functions.

2. PROCEDURE

2.1. Analytical Instruments - The maintenance procedures, calibration procedures and tuning procedures which are carried out by analysts are covered in detail in the analytical SOPs. Every analytical instrument is covered by a service contract which calls for immediate service from the vendor should a failure occur. In addition to covering the instrument hardware, the software which controls the instruments is also covered by a maintenance contract. The department supervisor is responsible for the maintenance of the instruments within his laboratory.

2.2. Ancillary Equipment - The inorganic laboratory supervisor is responsible for all the ancillary equipment listed below except for the GC items which are the responsibility of the GC Supervisor. In addition to routine instrument maintenance provided by manufacturer's maintenance contracts and software services, Envirotech will perform the following checks to insure that ancillary equipment and instrumentation are capable of functioning properly:

2.2.1. Analytical Balances

2.2.1.1. The balance is to be certified and checked once a year by a balance servicing company.

2 2.1.2. The analytical balance is to be checked once per month with class S weights, over the range of 10 milligrams to 30 grams.

2.2.1.3. All pertinent information will be recorded in a bound log book.

2.2.2. pH Meters

2.2 2.1. Meters are to be standardized against two buffers that bracket the pH of the sample.

2.2.2.2. The electrodes will be immersed in an appropriate buffer or water when not in use, and filled with an appropriate filling solution specified by the manufacturer.

2.2.2.3. A daily check of the pH meter will be made after calibration by setting the meter to pH 7.00 with a buffer standard and then with no further adjustment, reading pH buffer standards of pH 4.00 and 10.00 and recording the actual readings in a bound log book.

2.2.3. Spectrophotometers

2.2.3.1. A quarterly calibration of the Sequoia Turner Model 340 Spectrophotometer will be performed for determinations including cyanide and phenols.

2.2.3.2. The wavelength observed, date of check and analyst's name will be recorded in a bound log book.

2.2.4. Drying Ovens

2.2.4.1. The temperature of each drying oven will be recorded in a bound log book daily or for each day the oven is in use.

2.2.5. Refrigerators

2.2.5.1. The temperature of each refrigerator shall be recorded daily in a bound notebook by reading an in-place thermometer immersed in liquid on a shelf of the refrigerator.

2.2.6. Thermometers

2.2.6.1. All glass thermometers will be verified yearly by comparing the readings of these thermometers with a NBS traceable certified thermometer. Each thermometer will be identified and a record will be maintained including thermometer identification, the temperature of the certified thermometer, the temperature of the

thermometer being verified, date of verification and analyst who performed verification.

2.2.7. Gas Chromatograph Detectors

2.2.7.1. A record will be maintained for each detector with the serial number, date of installation, and background current profiles obtained at the time of installation.

2.2.8. Gas Chromatograph Columns

2.2.8.1. A record containing column ID number, date of packing or purchase, liquid phase identity and lot number of precoated column packing, conditioning temperature, flow rate and number of hours, length and shape of column, background current profiles and date of silation of column will be maintained for each column.

Analytical Methods

Envirotech Research, Inc. performs analyses using EPA methodology and other published authoritative methods A detailed description of our procedures for each method are found in our analytical standard operating procedures manual

The following analytical methods summary provides a listing of analytical methods routinely offered by Envirotech Research, Inc. as of January 1995. In addition, this summary provides a listing of major groups of analyses and analytical packages routinely offered. Additional methods are offered for special projects upon request.

The table provided below gives a summary of the pages that follow.

Methods and Parameters Contents Summary

Priority Pollutant Major Groups and Packages

600 Series Methods for Water and Wastewater
SW-846 Methods for Soil and Solid Waste

Parameter	Method Water/Soil
Priority Pollutant Volatile Organics with Xylenes (VOA)	624/8240
Priority Pollutant Volatile Organics +15 with Xylenes (VOA+15)	624/8240
Priority Pollutant Volatile Organics +15 with Xylenes, MTBE and TBA	624/8240
Priority Pollutant Base/neutral Extractable Organics (BN)	625/8270
Priority Pollutant Polynuclear Aromatic Hydrocarbons (PAHs)	625/8270
Priority Pollutant Base/neutral Extractable Organics +15 (BN+15)	625/8270
Priority Pollutant Base/neutral and Acid Extractable Organics (BNA)	625/8270
Priority Pollutant Base/neutral and Acid Extractable Organics +25 (BNA+25)	625/8270
Polychlorinated Biphenyls (PCBs)	608/8080
Priority Pollutant Pesticides & PCBs (Pest/PCB)	608/8080
Priority Pollutant Metals (PP Metals) 13 elements: As, Sb, Be, Cd, Cr, Cu, Ni,Pb, Hg, Se, Ag, Tl, Zn	200 Series/6010&7000

Full Priority Pollutants (VOA, BNA, PestPCB, and Metals)

Full Priority Pollutants +40 (VOA+15, BNA+25, Pest/PCB, Metals)

Target Compound List (TCL) Organics and
Target Analyte List (TAL) Metals Major Groups and Packages

600 Series Methods for Water and Wastewater
SW-846 Methods for Soil and Solid Waste

Parameter	Method Water/Soil
TCL Volatile Organics with Xylenes	624/8240
TCL Volatile Organics +10 with Xylenes	624/8240
TCL Volatile Organics +10 with Xylenes, MTBE and TBA	624/8240
TCL Base/neutral Extractable Organics	625/8270
TCL Base/neutral Extractable Organics +10	625/8270
TCL Base/neutral and Acid Extractable Organics	625/8270
Base/neutral and Acid Extractable Organics +20	625/8270
TCL Pesticides & PCBs	608/8080
TAL Metals 23 elements: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn	200 Series/6010&7000
Cyanide	335.2

Full TCL Analysis Package (VOA, BNA, PestPCB)

Full TCL+30 Analysis Package (VOA+10, BNA+20, PestPCB)

Full TAL & TCL Analysis Package (VOA, BNA, Pest/PCB, Metals CN)

Full TAL & TCL+30 Analysis Package
(VOA+10, BNA+20, Pest/PCB, Metals, CN)

USEPA Contract Laboratory Program (CLP)

Analysis and reporting is provided as specified in the 3/90 CLP Statement Of Work (SOW) Methodology for Organics Analysis Multi-Media, Multi-Concentration, document number OLM01.8

Metals and Cyanide analysis and reporting is provided as specified in the CLP SOW Methodology for Inorganic Analysis Multi-Media, Multi-Concentration, document ILM03 0

Parameter	Matrix
CLP Target Compound List (TCL):	
CLP-TCL Volatile Organics +10	Water or Soil
CLP-TCL Semivolatile Organics +20	Water or Soil
CLP-TCL Pesticides & PCBs	Water or Soil
Target Analyte List (TAL):	
Target Analyte List Metals 23 elements: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn	Water or Soil
Cyanide	Water or Soil
CLP-TCL +30 Organics Package	Water or Soil
Full CLP-TAL & TCL +30 Package	Water or Soil

When CLP analysis is required, please specify "CLP" analysis on the Chain-of-Custody record provided with your samples.

Prices include CLP full format laboratory deliverable reports.

CLP methods require site specific quality assurance samples. With each group of up to 20 environmental samples provided over a period of 14 days or less, a matrix spike and matrix spike duplicate are required, resulting in two billable samples.

Waste Characteristic Testing

Parameter	Method
Toxicity Characteristic Leaching Procedure (TCLP):	
1. TCLP Zero Headspace Extraction	1311
2. TCLP Inorganic and Semivolatile Organic Extraction	1311
3. TCLP Volatile Organics Analysis	8240
4. TCLP Base/neutral and Acid Extractable Organics Analysis	8270
5. TCLP Metals Analysis	6010/7471
6. TCLP Pesticides and Herbicides	8080/8150
Other RCRA Characteristic Tests:	
7. Ignitability	1020
8. Corrosivity	9045
9. Reactivity (Cyanide and Sulfide)	SW-846 Chapter 7.3
Other Waste Classification Tests:	
10. Total Petroleum Hydrocarbons (PHC)	418.1
11. Polychlorinated Biphenyls (PCBs)	8080

Waste Classification Packages		
Full TCLP	Items 3-6, Items 1-6,	Water Solid
Full TCLP, RCRA Tests, PHC & PCBs	Items 3-11 Items 1-11	Water Solid

Volatile Organic Profiles

Gas Chromatography	
Parameter	Method Water/Soil
•Acrolein & Acrylonitrile (GC-FID)	603/8030
•Alcohols or Glycols (GC-FID)	8015
•Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) (GC-PID)	602/8020
•To add MTBE, TBA or DIPE to a BTEX analysis add $10 per compound	
•To add Naphthalene to a BTEX analysis add $20	
•Purgeable Aromatics (GC-PID)	602/8020
•Purgeable Halocarbons (GC-ELCD)	601/8010
•Purgeable Halocarbons and Aromatics (GC-PID/ELCD)	601&602/8021
•Volatile Organics in (Drinking) Water (Capillary GC-PID/ELCD)	502.2

Gas Chromatography/Mass Spectrometry	
Parameter	Method Water/Soil
•Purgeable Organics in (Drinking) Water (Capillary GC/MS)	524.2
•Priority Pollutant Volatile Organics with Xylenes	624/8240
•Priority Pollutant Volatile Organics +15 with Xylenes	624/8240
•Priority Pollutant Volatile Organics +15 with Xylenes, MTBE and TBA	624/8240
•TCL Volatile Organics with Xylenes	624/8240
•TCL Volatile Organics +10 with Xylenes	624/8240
•TCL Volatile Organics +10 with Xylenes, MTBE and TBA	624/8240
•TCL Volatile Organics +10	CLP-SOW

Metals Analyses

Individual Metals					
Parameter		Method Water/Soil	Parameter		Method Water/Soil
Al	Aluminum	200.7/6010	Mg	Magnesium	200.7/6010
Sb	Antimony	204.2/6010	Hg	Mercury	245 1/7471
As	Arsenic	206.2/7060	Mo	Molybdenum	200.7/6010
Ba	Barium	200.7/6010	N	Nickel	200.7/6010
Be	Beryllium	200.7/6010	K	Potassium	200.7/6010
Cd	Cadmium	200.7/6010	Se	Selenium	270.2/7740
Ca	Calcium	200.7/6010	Ag	Silver	200.7/6010
Cr	Chromium, Total	200.7/6010	Na	Sodium	200.7/6010
Co	Cobalt	200.7/6010	Tl	Thallium	279.2/7841
Cu	Copper	200.7/6010	Sn	Tin	200.7/6010
Fe	Iron	200.7/6010	Tl	Titanium	200.7/6010
Pb	Lead	239.2/6010	V	Vanadium	200.7/6010
			Zn	Zinc	200.7/6010

- *A digestion fee is charged once per sample in addition to the analysis fee listed above for each individual metal.*
- *No digestion fee is charged for Mercury or Metals Packages.*
- *See* General Chemistry *Section, Page 8, for Hexavalent Chromium Analysis Prices.*

Metals Analysis Packages

Parameter	Matrix
RCRA or Drinking Water Metals 8 elements: As, Ba, Cd, Cr, Pb, Hg, Se, Ag	Water or Soil
Priority Pollutant Metals (PP Metals) 13 elements: As, Sb, Be, Cd, Cr, Cu, Ni,Pb, Hg, Se, Ag, Tl, Zn	Water or Soil
Target Analyte List Metals (TAL Metals) 23 elements: Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn	Water or Soil

General Chemistry

Parameter	Method Water/Soil
Acidity	305.1
Alkalinity	310.1
Carbon Dioxide, Free	406B
Cation Exchange Capacity	9081
Chemical Oxygen Demand	410.4
Chloride	325.3
Chlorine Residual	330.5
Chromium, Hexavalent (Cr+6)	I-1230-84/3060-7196A
Cyanide	335.2
Fluoride	340.2
Hardness	314A
Herbicides	515.1/8150
Nitrogen, Ammonia	350.3
Nitrogen, Nitrate	353.3
Nitrogen, Nitrite	353.3
Oil Grease, Gravimetric	413.1
Oil Grease, IR	413.2
Oxidation Reduction Potential (Water)	ASTM D1498
Oxygen, Dissolved (Winkler)	360.2
Petroleum Hydrocarbons, Total (PHC):	
• Standard turnaround analysis	418.1
• Three to Five work day *rush* analysis	418.1
• Next day *rush* analysis	418.1
pH - water samples	150.1
pH - soil samples	9045
Phosphate, Ortho	365.3
Phosphorous, Total	365.3
Phenols, Total	420.1
Residue:	
• Total Dissolved Solids	160.1
• Total Suspended Solids	160.2
• Total Solids	160.3
• Total Volatile Solids	160.4
• Settleable Solids	160.5
• Percent Solids (Moisture) in Soil	3550 Sec. 7.2
Specific Conductance	120.1
Sulfate	375.4
Total Organic Carbon - water	415.1
Total Organic Carbon - soil	9060
Turbidity	180.1

Petroleum Discharge Evaluation Analyses

Parameter	Method Water/Soil
Total Petroleum Hydrocarbons (PHC):	
• Standard turnaround analysis	418.1
• Three to Five work day *rush* analysis	418.1
• Next day *rush* analysis	418.1
Priority Pollutant Volatile Organics +15 with Xylenes (VOA+15)	624/8240
Priority Pollutant Volatile Organics +15 with Xylenes, MTBE and TBA	624/8240
Priority Pollutant Volatile Organics +15 with Xylenes and Naphthalenes	624/8240
Priority Pollutant Base/neutral Extractable Organics +15 (BN+15)	625/8270
Priority Pollutant Polynuclear Aromatic Hydrocarbons (PAH)	625/8270
Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)	602/8020
To add MTBE, TBA or DIPE to a BTEX analysis add $ per compound. To add Naphthalene to a BTEX analysis add $)	
Lead in Water (Including Digestion Fee)	239.2
Lead In Soil (Including Digestion Fee)	6010
Polychlorinated Biphenyls (PCBs)	608/8080
Hydrocarbon Product Identification (GC-FID):	
1) Qualitative - "GC-Fingerprint"	8015
2) Quantitative -	
•Specify Gasoline Range Organics (GRO)	
•or Diesel Range Organics (DRO)	8015
Extractable Organic Cleanup Procedures:	
• Acid-Base Partition Cleanup	3650
• Alumina Column Cleanup	3611

Appendix II

COST ANALYSIS
6TH STREET EMBANKMENT DEMOLITON
JERSEY CITY, NEW JERSEY

Prepared for:

THE CITY OF JERSEY CITY

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March 6, 2006

DRESDNER ROBIN

INTRODUCTION

The "Sixth Street Embankment" (Embankment) is the remaining element of a 7-track elevated rail viaduct constructed in the early 1900s by the Pennsylvania Railroad to support a freight rail service from the east side of the Palisades into the Harsimus section of Jersey City. Historic Maps indicate that the embankment replaced an earlier trestle structure occupying the south edge of the parcels. The Embankment consists of an earth-filled stone crib structure occupying portions of a six block area fronting Sixth Street between Marin and Monmouth Streets. Jersey City Tax records identify the parcels as Block 212 Lot A, Block 247 Lot 50A, Block 280 Lot 50A, Block 317 5 Lot 50A, Block 354.1 Lot 50A, Block 389.1 Lot 50. Steel girder bridge sections formerly spanned the City street grid linked the filled structured; these elements were demolished in the 1990s Residential neighborhoods border the Embankment along the entire six block extent. Sections of the stone retaining wall Directly abut occupied structures.

Residential redevelopment of the six parcels currently occupied by the Embankment has been proposed. Dresdner Robin has been retained to prepare a demolition cost analysis for the embankment as would be required to clear the parcels to permit redevelopment.

BACKGROUND

Soil Borings conducted by Dresdner Robin in 1997 indicate the embankment fill generally consists of a gravel/cinder layer overlying sand/silt mixture intermixed with areas of brick, gravel and wood fragments The fill is contained within a stone gravity wall constructed of rough-cut granite and sandstone blocks of varied lengths. Detailed plans of the wall construction have not been made available. Embankment elevations previously obtained by Dresdner Robin range from 12 to 26 feet above existing street grade.

COST ANALYSIS

The Embankment Demolition is a large scale earth moving operation conducted within a constrained densely populated urban environment.

The analysis evaluates the relative cost impact from three variables which will "drive" the removal cost: 1) haul distance; 2) tipping fees; and 3) project duration Each variable is directly influenced by the "disposal market" and immediate site environs that are functioning at the time of the work and therefore must be considered as a range to properly evaluate cost sensitivities.

a) Haul Distance—is a direct function of disposal availability The work will generate two and possibly three distinct materials for disposal. 1) stone; 2) mixed soil fill; and 3) gravel/cinder. Generally the mixed soil and gravel/cinder materials will require disposal as an ID-27 waste either at a landfill or a "beneficial reuse" facility Unrestricted disposal will likely only be available to

the stone fill material which will likely require crusher processing prior to placement. A secondary market may be located for minor amounts of stone but may require additional haulage resulting in little or no cost gain.

b) Tipping Fees—are generally charged by the disposal facility. Landfill disposal typically having a higher disposal fee than a beneficial reuse facility. Fees will typically vary depending on the facility, the quality and amount of material and the general market demand/saturation experienced at the time of disposal. Lower fees may in some cases be available but possibly offset by a grater haul distance. Facilities presently active in the local market that can receive fill materials of this type are located in Bayonne and the Hackensack-Meadowlands area.

c) Project duration—is dictated by numerous factors including the excavator(s) production rate, transport availability, disposal site availability and local traffic restrictions. The tracked-excavator considered in the study is the largest machine typically encountered in an urban construction site and has sufficient production capacity to maintain an eight-minute load cycle per transport vehicle but will require upwards of 60 work days to complete the average embankment removal. Additional excavators can shorten the project schedule, and reduce the overall crew cost but will significantly increase the amount of noise and heavy vehicle traffic on neighborhood streets and therefore may not be sustainable due to public opposition.

The Cost Analysis considers three production rates and three haul cycles to develop nine cost points; computed costs from a low of $14.2M to a high of $16.8M based on current (2006) pricing The analysis demonstrates that the production rate will directly control the project cost. For this reason it is our opinion that the probable cost will be in the upper range:

- The availability of large capacity receiving sites local to the project is declining. Discussion with a soil broker suggests that quarry reclamation sites will be the likely end disposal option necessitating an extended haul cycle;
- The Project will be noticeably disruptive, neighborhood opposition will limit the level of removal activity and the volume of truck traffic. Vehicle routing options will likely be restricted;
- Reconstruction of Rte 139 "covered roadway" will likely disrupt vehicular access into the project area for the next 5-7 years increasing transport cycle times and cost.
- No easement, supports or restraints are assumed for demolition adjacent to existing residential structures. Structures should be evaluated by a Structural Engineer prior to initiating work.

ASSUMPTIONS

1. Cut stone has no aftermarket value except as crushed aggregate. Identification of a local end user has a low probability. Facilities that might recut and market the stone are not local to the job site.
2. Track ballast/cinders is assumed to be the top 24-inches of fill layer and will be treated as ID-27 landfill disposal.
3. Removal/demolition of earlier trestle elements and or other buried structures will not be required.
4. Mixed soil is as solid waste disposed of as a beneficial reuse.
5. A standard 8-hour work day is assumed with no other local restrictions.
6. No special local permits or work conditions are assumed.
7. Quantities are based on existing cross-section data and City Tax Map Data, no topographic survey has been performed.
8. All other assumptions are identified on worksheets.

LIST OF ATTACHMENTS

1. 6th Street Embankment Demolition Estimate, Dresdner Robin February 8, 2006
2. Project Area Photograph
3. Figure 2, JCRA-6th Street, Soil Boring Location Map, Dresdner Robin, January 21, 1998
4. Figure 3, JCRA-6th Street, Embankment Cross-Section, Dresdner Robin, January 21, 1998
5. Figure 4, JCRA-6th Street, Base Neutral Constituents in Soil Samples in Exceedance of the NJDEP Residential Direct Contact Soil Clean-up Criteria, Dresdner Robin, January 21, 1998
6. Figure 5, JCRA-6th Street, Inorganic Constituents in Soil Samples in Exceedance of the NJDEP Residential Direct Contact Soil Clean-up Criteria, Dresdner Robin, January 21, 1998
7. Test Boring Logs, Dresdner Robin, December 1997
8. Volume Calculation Worksheets
9 Photographs